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ABSTRACT

This manual provides the citizen with basic information for taking action against air pollution. A summary of the effects of various concentrations of sulfur oxides, particulate matter, carbon monoxide, photochemical smog, and hydrocarbons is presented. Suggestions are made for obtaining information about community air pollution problems, and how the Air Quality Act of 1967 may relate to an abatement of these problems. The manual provides guidelines for the formation on concerned citizens' organizations, and suggestions for meetings and programs of action against air pollution. A glossary and a list of air quality control regions are included. (PR)

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your right to clean

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A MANUAL FOR CITIZEN ACTION

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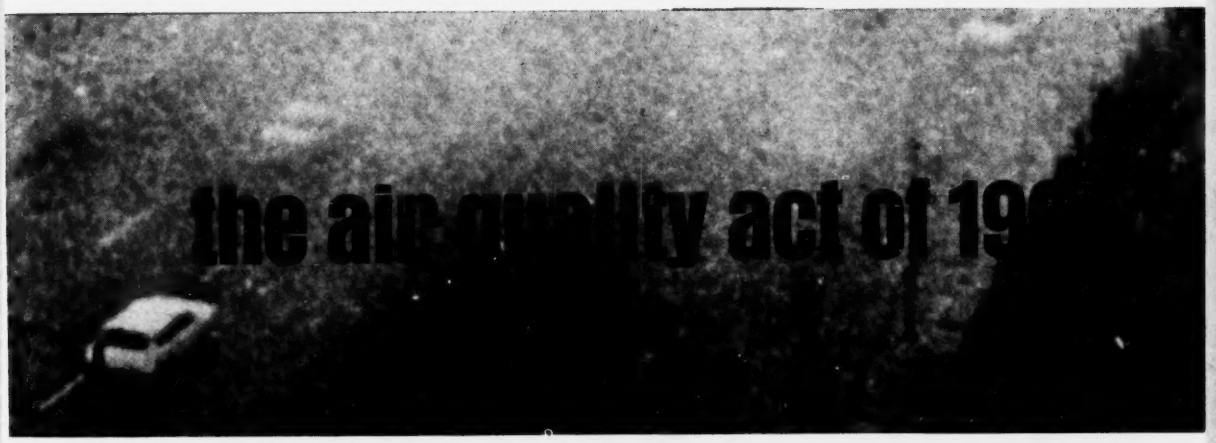
the air quality act of 19

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Air conservation . . . is everyone's responsibility. . . . [Pollution] is rooted in every fiber of our modern way of life—in the way we build our cities . . . the ways in which we obtain the energy needed to heat and light all the places where we live and work and to run our vast industrial complex, the ways in which we produce and package a multitude of manufactured goods, and, among other things, the ways in which we use those goods and dispose of the leftovers. Thus, to one degree or another, we are all polluters.

Dr. John T. Middleton, National Air Pollution Control Administration, address to the New England Conference on Air Pollution, Waterville, Maine, December 2, 1968.

what are we doing about it?

What have we done about control? Not enough. The first—and weak—federal air pollution control act was passed in 1955. Many state and local governments have established nominal control programs. Industry continues to spend only a very small proportion of its resources on research, development and installation of pollution control devices.

Now, however, the nation has a federal law, the Air Quality Act of 1967, with enough teeth to produce cleaner air—if it is executed at all levels of government and industry. Citizen concern and involvement are essential to such execution.

The cornerstone of our national policy on air pollution has been this declaration in the original 1955 law: "The Congress finds . . . that the prevention and control of air pollution at its source is the primary responsibility of states and local governments." The 1967 law echoes the 1955. But now, if the states fail to meet their control responsibilities, the federal government is empowered to take corrective action.

The new law contains many shortcomings. In some instances, too much time must elapse before the Department of Health, Education and Welfare (HEW) can act; in other instances, the Act sets no deadlines, leaving HEW the option to decide if and when to act. The law actually forbids HEW to act against *intra*state air pollution, short of an emergency posing an imminent threat to health, unless requested to do so by the governor of the state concerned.

But at least some lines have been drawn. HEW is now required to issue criteria of air quality—documenting the levels of pollutants at which various kinds of damage occur—to protect the public health and welfare. The states are now required to formulate proposals for

air quality standards, hold public hearings on the standards, then adopt them and submit them to the federal government for approval. If the states do not take these actions, the federal government can.

Here's how the Air Quality Act of 1967 works:

Control Regions

• HEW designates air quality control regions, based on climate, meteorology, topography, urbanization and other factors affecting pollution problems. This process is underway for 91 major metropolitan regions across the nation. (See page 82 for a list of these air quality control regions.)

Criteria

• HEW develops air quality *criteria* for the major pollutants: particulate matter, sulfur oxides, hydrocarbons, carbon monoxide, etc. These criteria relate the levels at which given pollutants, by themselves and in combination, are known to have adverse effects on ". . . public health or welfare." (See page 85 for a list of pollutants.)

• Simultaneously, HEW provides information on *control techniques* for each of these pollutants, describing methods to achieve the levels noted in the criteria. Such information must include the latest available technology, costs of emission control, and the economic feasibility of alternative control methods.

Standards

• After receiving federal criteria and control technology data, the state must formulate air quality *standards,* which are goals to be met. The standards set maximums on total amounts of specific pollutants permitted in the ambient air. The standards must be developed for designated control regions or portions of regions within that state.

• Before adopting air quality standards, a state must hold a *public hearing* at which citizens may express their views on the proposed air quality standards for the region. After state adoption, standards are subject to federal review and approval.

Implementation

• Once the standards are approved by HEW, the state must then produce a ". . . plan for the *implementation,* maintenance and enforcement" of its air quality standards (emphasis added). If approved by HEW, this plan goes into effect.

• If HEW finds either the standards or the implementation plan in-

adequate, it may refuse approval. HEW is then empowered to formulate such standards or plans for the air quality control region in question. This procedure is also followed if a state fails to comply with the Act or to meet its timetable.

Enforcement

• After standards and plans are in effect, the federal government continues to monitor air quality in a region. If the control measures are ineffective, HEW notifies the state of this violation of federal law. After such notification, the state must take "reasonable" enforcement action within 180 days. If the state fails—and *inter*state pollution is involved—HEW may request the Department of Justice to secure abatement through the federal courts. If the problem is strictly *intra*state, the federal government can act only if requested to do so by the governor of the state.

Emergency Authority

• HEW has potent new authority to seek federal court action at any time to stop air pollution in emergencies—when HEW officials judge that the pollution presents ". . . an imminent and substantial endangerment to health of persons." The law also requires state enforcement plans to contain similar emergency authority.

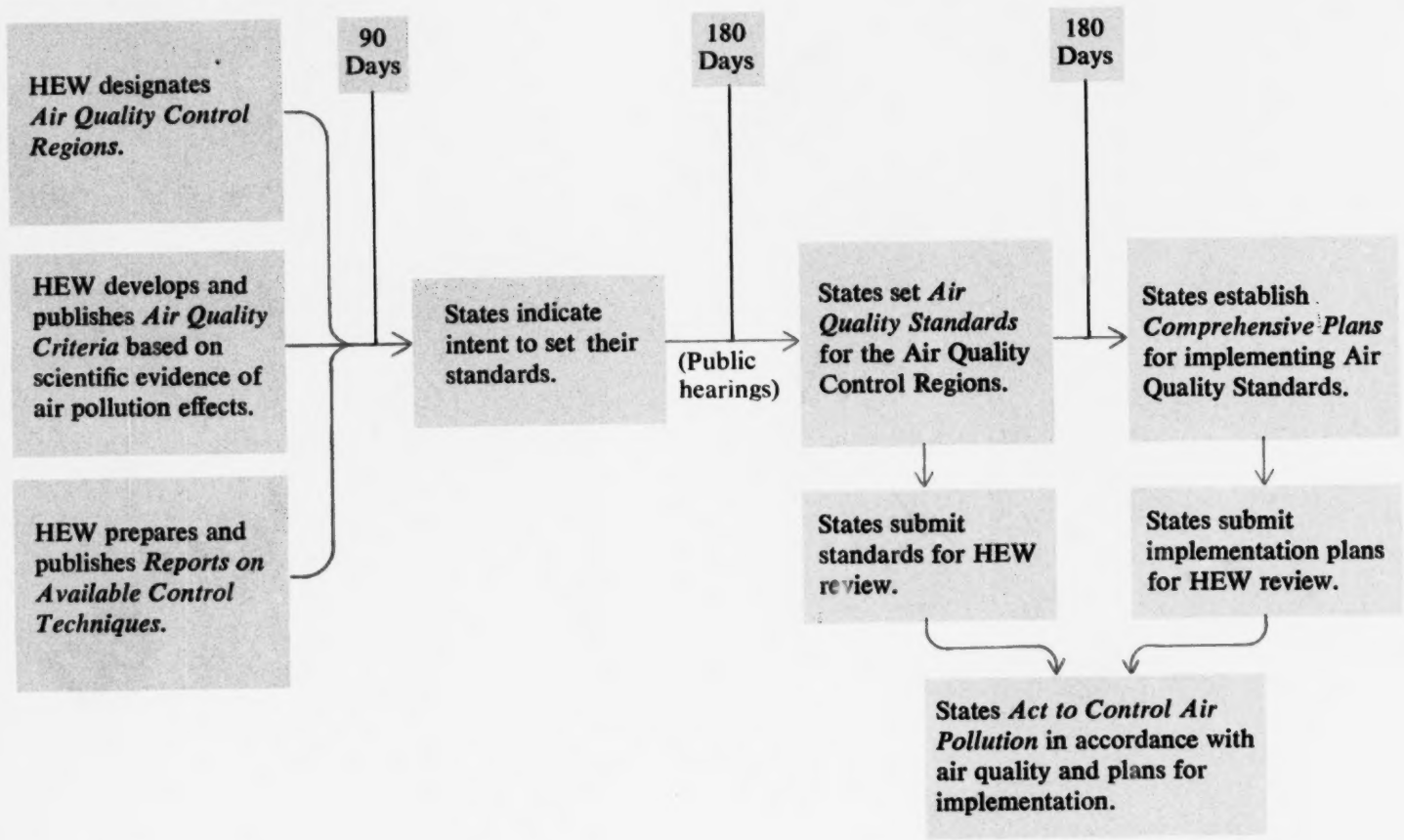
Timetable

• From designation to implementation, the cycle is geared to a *timetable*. After designation, a governor has 90 days to submit to HEW a "letter of intent" indicating that the state will comply with the Act. After an additional 180 days, during which public hearings must be held, air quality standards must be adopted. After another 180 days, the implementation plan must be adopted. (See Flow Diagram, page 23.)

In short, the Act sets in motion a complex, cumbersome and lengthy process. Massive amounts of information and data are being gathered, analyzed and compiled by the federal government. Numerous profound social, economic and political decisions affecting air quality—often disguised as narrow, highly technical judgments—will be made. And the law provides citizens with an opportunity to influence the process and its outcome.

FLOW DIAGRAM FOR ACTION TO CONTROL AIR POLLUTION ON A REGIONAL BASIS, UNDER THE AIR QUALITY ACT.

Guidelines for the Development of Air Quality Standards and Implementation Plans, U. S. Department of Health, Education and Welfare, May 1969.


HEW designates *Air Quality Control Regions.*
HEW develops and publishes *Air Quality Criteria* based on scientific evidence of air pollution effects.
HEW prepares and publishes *Reports on Available Control Techniques.*
90 Days
States indicate intent to set their standards.
180 Days
(Public hearings)
States set *Air Quality Standards* for the Air Quality Control Regions.
180 Days
States establish *Comprehensive Plans* for implementing Air Quality Standards.
States submit standards for HEW review.
States submit implementation plans for HEW review.
States *Act to Control Air Pollution* in accordance with air quality and plans for implementation.

We must maintain that which is not defiled, enhance that which is degraded, and restore that which has been destroyed. . . . None of this can be done if the people of this nation leave the decisions and efforts to government and industry alone.

Senator Edmund S. Muskie, address to the Consumer Federation of America, January 30, 1969.

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the role of the citizen

Why should citizens get involved in the fight for clean air? There are two fundamental reasons: first, to protect the broad public interest in clean air; second, to make certain all benefits of clean air are given full consideration.

Citizens voice the broad, humanistic goals implicit in the struggle to clean up the air. Citizens, who breathe polluted air and who endure its dangers, its costs and its offenses, tend to ask the most important questions of all: How clean can we get the air? How long will it take?

Now that the nation has begun to make decisions about air quality that affect our future and that of millions of human beings, it is important to realize that these decisions will be shaped by the complicated and shifting pattern of interests which influence all public and private decisions about our environment. Many industrial and governmental operations will be affected by requirements for the prevention and control of air pollution. As each decision draws near, those who profit in some way from the lack of such requirements will prepare with time, money and information to protect their interests. These efforts must be countered by citizens insisting on intelligent, efficient clean-up programs.

Citizens are willing to assign value to all benefits of clean air, not just to those that experts can measure in terms of direct health effects or economic costs. To live and work in polluted air is, per se, less desirable than to live and work in clean air. But it is difficult to measure this factor. The value of a clear sky, of good visibility, of general enjoyment of the cityscape and landscape in an environment relatively free of air pollution falls in the no-man's land between cause-and-effect health considerations and economic cost-benefit ratios. But while decision-makers are weighing the health or economic values of

clean air, they should not ignore its other benefits. Citizens must make a point of seeing that such neglect does not occur.

In short, the very vitality of the national program to clean up the air depends upon citizen involvement in the process. Only an active, informed citizenry can ensure a fair and complete presentation of the case for stringent control, providing the best chance for the adoption and achievement of such control.

The ability of the people to decide what is in the public interest and the protection of that interest is the essence of our democracy. Our society should become greatly concerned if all serious public problems are decided in closed-door meetings of scientific experts (elites) which prevent full public participation in such decision-making.

Carl W. Bruch, *Voluntary Private Behavior as a Means to Reduce Consumer Health Hazards and Environmental Pollution*. The Brookings Institution, Washington, D.C., 1969.

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what you have to work with

Although complicated and ponderous, the system of control outlined by the Air Quality Act offers concerned citizens tools to help them obtain cleaner air. Some major tools include the federal criteria documents, control technology documents, guidelines explaining the Act, and regional consultation reports.

IS THERE PROOF OF HARM?

The federal criteria documents effectively counter objections from polluters that no studies link air pollution with harm to human health and welfare. These documents support the judgments of ordinary citizens, based on their esthetic and common sense, that stricter control is necessary. The criteria describe the levels at which harm from given pollutants has been detected.* They are fairly exhaustive collections of most of the known data on the properties and effects of specific pollutants and of their interactions. They relate effects of different levels and combinations of each pollutant on health, visibility, vegetation, and on inert materials such as metal and paint. They also cover known economic losses and other relevant factors which help the citizen to judge desirable limits on concentrations of particular pollutants.

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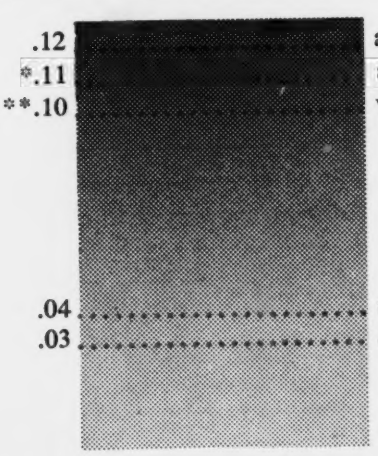
* One caution should be sounded here: The criteria describe *currently known* levels at which harm is detectable. Increasing scientific knowledge probably will confirm the existence of ill effects at even lower levels. For instance, 11 years ago, the industrial health standard for carbon monoxide was 100 parts per million, eight-hour average. In 1967, the federal government changed this standard to 50 parts per million. Recent NAPCA criteria for carbon monoxide state that even more stringent control levels are necessary. (The criteria for carbon monoxide issued by NAPCA in March 1970 suggests that, in light of present knowledge, the most prudent level for carbon monoxide is 10 parts per million, eight-hour average.)

AIR QUALITY CRITERIA FOR SULFUR OXIDES

published by NAPCA, February 11, 1969

parts per million: ppm (annual means unless otherwise noted)



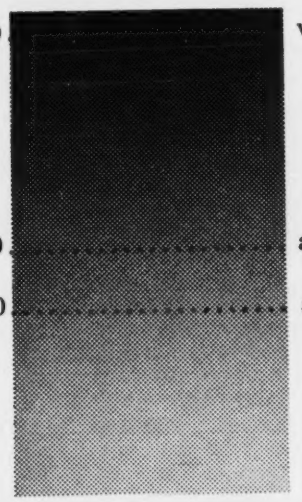
* 24-hour average for 3-4 days

** with comparable concentration of particulate matter and 50% relative humidity

AIR QUALITY CRITERIA FOR PARTICULATE MATTER

published by NAPCA, February 11, 1969

micrograms per cubic meter: $\mu g/m^3$ *(annual means)*



≠ where the predominant particle size ranges from 0.2 micron to 1 micron and the relative humidity is less than 50%

EFFECTS OF CARBON MONOXIDE*

Environmental conditions	*Effect*	*Comment*
35 mg/m³ (30 ppm) for up to 12 hours.	Equilibrium value of 5 percent blood COHb is reached in 8 to 12 hours; 80 percent of this equilibrium value, (4 percent COHb) is reached within 4 hours.	Experimental exposure of nonsmokers. Theoretical calculations suggest exposure to 23 (20 ppm) and 12 mg/m³ (10 ppm) would result in COHb levels of about 3.7 and 2 percent, respectively, if exposure was continuous for 8 or more hours.
58 mg/m³ (50 ppm) for 90 minutes.	Impairment of time-interval discrimination in nonsmokers.	Blood COHb levels not available, but anticipated to be about 2.5 percent. Similar blood COHb levels expected from exposure to 10 to 17 mg/m³ (10 to 15 ppm) for 8 or more hours.
115 mg/m³ (100 ppm) intermittently through a facial mask.	Impairment in performance of some psychomotor tests at a COHb level of 5 percent.	Similar results may have been observed at lower COHb levels, but blood measurements were not accurate.
High concentrations of CO were administered for 30 to 120 seconds, and then 10 minutes was allowed for washout of alveolar CO before blood COHb was measured.	Exposure sufficient to produce blood COHb levels above 5 percent has been shown to place a physiologic stress on patients with heart disease.	Data rely on COHb levels produced rapidly after short exposure to high levels of CO; this is not necessarily comparable to exposure over a longer time period or under equilibrium conditions.

An exposure of 8 or more hours to a carbon monoxide concentration of 12 to 17 mg/m³ (10 to 15 ppm) will produce a blood carboxyhemoglobin level of 2.0 to 2.5 percent in nonsmokers. This level of blood carboxyhemoglobin has been associated with adverse health effects as manifested by impaired time interval discrimination. Evidence also indicates that an exposure of 8 or more hours to a CO concentration of 35 mg/m³ (30 ppm) will produce blood carboxyhemoglobin levels of about 5 percent in nonsmokers. Adverse health effects as manifested by impaired performance on certain other psychomotor tests have been associated with this blood carboxyhemoglobin level, and above this level there is evidence of physiologic stress in patients with heart disease.

There is some epidemiological evidence that suggests an association between increased fatality rates in hospitalized myocardial infarction patients and exposure to weekly average CO concentrations of the order of 9 to 16 mg/m³ (8 to 14 ppm).

* From the Resumé, *Air Quality Criteria for Carbon Monoxide*, U.S. Department of Health, Education and Welfare, March 1970.

Evidence from other studies of the effects of CO does not currently demonstrate an association between existing ambient levels of CO and adverse effects on vegetation, materials, or other aspects of human welfare.

EFFECTS ASSOCIATED WITH OXIDANT CONCENTRATIONS IN PHOTOCHEMICAL SMOG*

Effect	*Exposure* ppm	*Exposure* $\mu g/m^3$	*Duration*	*Comment*
Vegetation damage	0.05	100	4 hours	Leaf injury to sensitive species. Result of panel response.
Eye irritation	Exceeding 0.1	200	Peak values	Such a peak value would be expected to be associated with a maximum hourly average concentration of 50 to 100 $\mu g/m^3$ (0.025 to 0.05 ppm).
Aggravation of respiratory diseases—asthma	0.13[a]	250	Maximum daily value	Patients exposed to ambient air. Value refers to oxidant level at which number of attacks increased. Such a peak value would be expected to be associated with a maximum hourly average concentration of 100 to 120 $\mu g/m^3$ (0.05 to 0.06 ppm).
Impaired performance of student athletes	0.03 to 0.30	60 to 590	1 hour	Exposure for 1 hour immediately prior to race.

[a] Calculated from a measured value of 0.25 ppm (phenolphthalein method) which is equivalent to 0.13 ppm by the KI method.

Under the conditions prevailing in the areas where studies were conducted, adverse health effects, as shown by impairment of performance of student athletes, occurred over a range of hourly average oxidant concentrations from 60 to 590 $\mu g/m^3$ (0.03 to 0.3 ppm). An increased frequency of asthma attacks in a small proportion of subjects with this disease was shown on days when oxidant concentrations exceeded peak values of 250 $\mu g/m^3$ (0.13 ppm), a level that would be associated with an hourly average concentration ranging from 100 to 120 $\mu g/m^3$ (0.05 to 0.06 ppm). Adverse health effects, as manifested by eye irritation, were reported by subjects in several studies when photochemical oxidant concentrations reached instantaneous levels of about 200 $\mu g/m^3$ (0.10 ppm), a level that would be associated with an hourly average concentration ranging from 60 to 100 $\mu g/m^3$ (0.03 to 0.05 ppm).

* From the Resumé, *Air Quality Criteria for Photochemical Oxidants,* U.S. Department of Health, Education and Welfare, March, 1970.

Adverse effects on sensitive vegetation were observed from exposure to photochemical oxidant concentrations of about 100 $\mu g/m^3$ (0.05 ppm) for 4 hours. Adverse effects on materials from exposure to photochemical oxidants have not been precisely quantified, but have been observed at the levels presently occurring in many urban atmospheres.

HYDROCARBONS*

Studies conducted thus far of the effects of ambient air concentrations of gaseous hydrocarbons have not demonstrated direct adverse effects from this class of pollution on human health. However, it has been demonstrated that ambient levels of photochemical oxidant, which do have adverse effects on health, are a direct function of gaseous hydrocarbon concentrations; and when promulgating air quality standards for hydrocarbons, their contribution to the formation of oxidant should be taken into account.

An analysis of 3 years of data collected in three American cities shows that on those several days a year when meteorological conditions were most conducive to the formation of photochemical oxidant, nonmethane hydrocarbon concentrations of 200 $\mu g/m^3$ (0.3 ppm C) for the 3-hour period from 6:00 to 9:00 a.m. might produce an average 1-hour photochemical oxidant concentration of up to 200 $\mu g/m^3$ (0.10 ppm) 2 to 4 hours later. The hydrocarbon measurements were confined to 200 $\mu g/m^3$ (0.3 ppm C), or above, because of instrumentation limitations. However, if the functional relationship between the hydrocarbon and photochemical oxidant measurements were extended to include the lowest levels at which photochemical oxidant has been observed to adversely affect human health, the corresponding hydrocarbon concentration would be approximately 100 $\mu g/m^3$ (0.15 ppm C).

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* From the Resumé, *Air Quality Criteria for Hydrocarbons*, U.S. Department of Health, Education and Welfare, March 1970.

The complete criteria documents are voluminous and technical. There are, however, separately published "summary and conclusion" booklets for each pollutant. These are highly informative, usable and vital to the layman who wants to understand the problem. Free copies are available from the National Air Pollution Control Administration (NAPCA). (See page 100 for a bibliography of air pollution control information.)

To date, criteria documents have been issued for these pollutants: particulate matter, sulfur oxides, carbon monoxide, photochemical

oxidants, and hydrocarbons. NAPCA plans to issue criteria on other pollutants as the data on them is compiled.

If you are just starting to educate yourself about air pollution control, you will want to read some of the excellent background material such as the *Air Pollution Primer* and the *Air Pollution Workbook* listed in the bibliography. These will help you understand the implications of the criteria documents.

HOW IS THE AIR WHERE YOU LIVE?

After studying the criteria documents, the next thing to do is to find out how dirty the air is in your community. By comparing air pollution levels in your area with the criteria levels, you can judge the severity of your problems.

If you live in an area already designated as an air quality control region (see page 82 for a list of present and future regions), obtaining this information is relatively easy. The designation is usually preceded by the issuance of a "consultation report" by NAPCA describing

WHAT INFORMATION SHOULD YOU REQUEST?

Your local or state air pollution control agency should be able to tell you:

1. Results of latest samplings of specific pollutants in your control region, including annual geometric means, maximum and minimum levels, means in cleanest communities versus means in most polluted communities, number and location of sampling sites, number of samples taken and methods used. (Do not accept averages of means. If several low-pollution area readings are averaged with a high-pollution area, the resulting figure will be deceptively low.)
2. Results of emission inventories, including amounts of specified pollutants from all major sources.
3. Trends in levels of pollutants based on sampling records.
4. Results of any local economic or health effects studies or surveys.
5. Descriptions of pertinent meteorological and topographical conditions which influence air quality.
6. Copies of existing air pollution control laws (city, county, state and regional) and explanations of the local and state control agencies' composition and function (e.g., flow charts of enforcement processes), budget totals and allocations.

the region's pollution problems. It usually represents the most recent comprehensive survey of the nature and extent of air pollution in the area. These reports are brief and well illustrated with maps, charts and graphs. The data is easily compared with the criteria since the two documents are designed to complement each other. Often other state and local reports containing similar information will use different methods of measurement, alternate terms or other forms making comparison more difficult. If local or state air pollution control agencies do not have copies of your consultation report available, write to NAPCA for it.

If your region is slated for designation in the near future, NAPCA has probably already collected the data for the consultation report. Write to the state and local agencies which furnished the information, or write to NAPCA to obtain it.

If the data for your region has not yet been collected for the federal report, write your local or state agency to obtain comparable information. These agencies have a responsibility to keep the public informed of air quality conditions and should be issuing regular and comprehensible reports. To avoid receiving highly technical, obscure information, make your inquiry as specific as possible. Submit your questions in writing, clearly stated point by point. Don't be shy about persisting to get the information you need. Don't be satisfied by vague assurances that progress is being made, that everything is under control, and that you don't have to concern yourself at all. This is for you to decide, after you have examined the evidence.

CAN IT BE CLEANED UP?

Once you have discovered what your community's air pollution problems are, you will want to know what technology can do about them. The federal control techniques documents, published simultaneously with the criteria for each pollutant, provide this information. These compilations describe the availability and applicability of such techniques, their costs, effectiveness, and the feasibility of alternative methods. Just as the criteria documents arm you with proof that air pollution causes harm, so the control technology documents explain how control can be achieved and at what costs.

And don't forget that the Air Quality Act clearly implies that human health must be protected, regardless of costs.

The committee feels that under any circumstances protection of health should be considered a minimum requirement and wherever possible standards should be established which enhance the quality of the environment. . . . Considerations of technology and economic feasibility, while important in helping to develop alternate plans and schedules for achieving goals of air quality, should not be used to mitigate against protection of the public health and welfare.

U.S. Senate Committee on Public Works, Senate Report No. 403, July 13, 1967.

SOME WAYS TO CONTROL AIR POLLUTION

Keep the pollutant from coming into existence:

1. Change raw materials.
2. Change operational procedures.
3. Modify or replace process equipment.
4. Adopt an alternate production method that yields fewer wastes.
5. Use existing equipment more efficiently.

Destroy, alter or trap the pollutant before it gets into the air:

1. Destroy combustible pollutants by fire or catalytic burning.
2. Alter the pollutant by chemical processes.
3. Trap the pollutant with filters or other collecting devices.

HOW DOES THE ABATEMENT PROCESS ACTUALLY WORK?

Knowing your community's problems and some solutions, you can now focus on the abatement process outlined in the federal law. Keep in mind this important premise of this law: Prevention and control of air pollution are primarily the responsibility of state and local governments—the federal role is the provision of leadership and assistance in establishing effective control programs at these levels.

To help you understand how this cooperative process is intended to work, HEW has issued a document entitled *Guidelines for the Development of Air Quality Standards and Implementation Plans.* Plainly written and well organized, the *Guidelines* answer many of the questions that may occur as you examine the legislation and its impact upon your community. Like all legislation, the Air Quality Act depends for its effectiveness upon its interpretation and upon the quality and efficiency of its execution. The *Guidelines* give a good sense of the spirit in which the federal government intends to administer the clean-up program. Ask your state agency or NAPCA for a copy.

Note that the step-by-step procedure requires a focus, not on the total problem at once, but on those specific pollutants for which criteria and control technology documents have been compiled. As each new set is issued, the timetable described on page 23 goes into effect for that class of pollutants.

Citizens sometimes have a hard time making a case for strict air pollution control. They must compete with "experts" who can muster or withhold facts to support their own case. But there are sound and relevant across-the-board arguments that citizens almost anywhere can use to counter some arguments used by industrial polluters:

1. *The Company would like to control pollution, but the technology is not available to do so. Answer:* While there are technical difficulties in controlling some forms of air pollution, existing technology can handle most air pollution problems. Many firms manufacture air pollution control equipment. There are also non-polluting solid waste disposal systems. NAPCA has issued documents on available air pollution control technology. And stockbrokers often have reports on companies in the pollution control business.

2. *The Company would like to install control equipment but can't afford it. Answer:* A company will often save enough valuable material from going up in smoke to pay for the equipment. In many cases, tax incentives encourage installation. Sooner or later, the company is going to have to spend the money. With inflation, the sooner the better to save money—and at the same time, to gain public relations benefits. If a company official still argues about the cost, ask for a written justification of his stand that takes the public health damages of air pollution into account. On a total-system accounting basis, according to *Fortune* Magazine, cleaning up air pollution will save billions of dollars, create thousands of new jobs, and provide a big boost to the economy.

3. *If standards are made stricter, the Company will move its plant to another state. Answer:* Concern about air pollution is nation-wide; companies will not find citizens in other localities much more lenient to polluters. Also, all states now have federal air quality regions and more regions are coming. Air quality standards adopted by all regions are subject to federal approval. In addition, Congress is considering national emission control standards. There will soon be no place for polluting industries to hide.

4. *Strict pollution controls will make it impossible to attract industry to our area. Answer:* This fear is largely unfounded. If a company has done a full-scale feasibility study on a new plant location and finds the area favorable in terms of transportation, labor pool, raw materials and markets, it is unlikely to alter its decision because of pollution control standards. It knows that these standards are tightening up all over the country, and it must learn to live with the inevitable. Good standards will also ensure that the area will remain a desirable one for employees to live in and raise their families.

5. *The Company will have to shut down, causing unemployment in the community. Answer:* This argument is usually a type of blackmail. Shutdown may be a possibility for marginal plants operating with outmoded equipment or otherwise non-competitive practices. These plants are much more likely to close for economic reasons unrelated to pollution control. Control costs, at the worst, will hasten their inevitable closure. But, in general, a plant operating profitably stands to lose far too much money by closing down—more money than pollution control would cost.

6. *The Company would like the state to adopt good standards, but the ones proposed are unreasonable. Answer:* "Unreasonable" is a relative term. Unreasonable for whom? Insist that the company explain what it means. Do its "reasons" take into account health and esthetic benefits, possible long-term ecological effects? Be wary of misleading "air pollution control budgets" which include the costs of a company's lawyers and lobbyists or its clean air advertising campaign. Remember that expecting people to put up with pollution is unreasonable, especially when the technology exists to abate it.

SETTING THE STANDARDS

The next step is the development of air quality standards—setting the levels at which particular pollutants will be tolerated in the air of a control region. Previous stages—designation of regions, issuance of criteria and development of guidelines—have all been part of the federal role. Now it is the state's turn to act.

For each pollutant, the state must set two kinds of standards: a long-term standard, such as the annual geometric mean, and a short-term standard, for peak periods of pollution concentration, such as one hour or one day. In addition, all standards should:

- Be expressed in measurements easily comparable to—and preferably the same as—those in the federal criteria (e.g., parts per million for gases, micrograms per cubic meter for particulates).
- Specify the sampling techniques to be used in measuring pollution levels.
- Include a timetable for attaining the desired level of air quality.
- Provide a built-in margin of safety. Obviously, health is not protected at pollution levels where ill effects begin to appear. And margins should be left for possible long-term adverse effects occurring below presently detectable levels.

19

• Contain a non-degradation clause. Within a region, areas where air pollution levels are already below the proposed goals should be protected from any increase "up" to those levels. Standards which, fully implemented, would permit continuing deterioration of air quality in any sizable portion of an air quality region are clearly in conflict with the expressed purpose of the law.

Finally, analyze the proposed standards to determine if they will actually enhance air quality in the region. For example, will the standards lower the annual and short-term pollution levels in clean areas as well as in dirty areas?

YOUR CHANCE TO BE HEARD

To comply with the federal law, states must hold public hearings on proposed air quality standards.

It is interesting to compare states' numbers with those in the chart on page 29 which show at what levels adverse effects have been detected, according to HEW's criteria. Keep in mind that all numbers must be interpreted in light of a timetable for achievement and of implementation plans, etc.

Anyone can attend this hearing and express his views about cleaner air. According to the federal *Guidelines,* the hearings are intended to provide the greatest possible opportunity for public participation, including private citizens as well as representatives from business, industry, science, medicine, and other interests.

The law leaves it to the state to determine exactly when and where such hearings will be held and to establish the rules under which they will be called and conducted. Consequently, you will have to find out what procedures govern your state's public hearing process. Practices vary significantly from state to state and may not, in actuality, be geared to public participation.

State action can, in fact, severely limit meaningful public participation. In some instances, the state air pollution control authority has refused to give even a general idea of prospective hearing dates. In others, the state has announced the date only a few days in advance, thus obstructing effective preparation by citizens. Some states have done a poor job of publishing proposed standards in advance of the hearing. In one case, a state released a new draft of proposed standards at the hearing itself.

Actions such as these make public participation a mere pretense and raise serious questions about the sincerity of the control agency's

STANDARDS PROPOSED BY SOME STATES FOR SULFUR OXIDES AND PARTICULATE MATTER

State	*Particulate Matter* (micrograms per cubic meter: $\mu g/m^3$)		*Sulfur Oxides* (parts per million: ppm)	
	Before hearing	*After hearing**	*Before hearing*	*After hearing**
Indiana Illinois	annual 75 24 hr. 300	75 260	annual .015 24 hr. .20 1 hr. .50	.015 .17 .42
Pennsylvania	annual 100 24 hr. 300	65 195	annual .03 24 hr. .25 1 hr. .50	.02 .10 .25
New Jersey	annual 65 24 hr. 195	— —	annual .02 24 hr. .10 1 hr. .20	— — —
Delaware	annual 110 24 hr. 250 (for urban areas)	70 200	annual .04 24 hr. .22 1 hr. .50	.03 .13 .30
Colorado	annual 55 24 hr. 180	— —	annual .009 24 hr. .05 1 hr. .10	— — —
Massachusetts	annual 80 24 hr. 180	— —	annual .031 24 hr. .105 1 hr. .280	— — —
Virginia	annual 80 24 hr. 125	60 100	annual .05 24 hr. .10	.02 .10
Maryland	annual 65 24 hr. 140	— —	annual .01 24 hr. .05 1 hr. .10 5 min. .25	— — — —
District of Columbia	annual 65 24 hr. 140	— —	annual .02 24 hr. .08 1 hr. .25	— — —
Missouri	annual 75 24 hr. 200	— —	annual .02 24 hr. .10	— —

* dash (—) indicates no changes were made. In several cases, this reflects citizen acceptance or support of the state's numbers rather than any official neglect of citizen views.

The numbers quoted here are given only as a general indication of some standards proposed. They cannot accurately be compared with each other, since differences in the wording of the various state regulations affect any numerical values. For example, to compare two states' numbers it would be necessary to know if the annual mean is arithmetic or geometric; what sampling techniques are specified; what background (i.e., natural) pollutant levels exist, etc. However, assuming that most such conditions are roughly equivalent, a standard of 60 $\mu g/m^3$ is preferable to one of 100 $\mu g/m^3$.

interest in cleaner air and its regard for citizens' opinions. Given the complex nature of the problems, it is essential that the concerned citizen have adequate time to review the relevant documents in order to make an informed judgment about them.

Take every precaution to ensure that your agency gives sufficient notice of the hearing and that copies of the proposed standards are made available to you and your fellow citizens well in advance. Check to find out how your state will proceed with the hearing and ask that the control agency:

1. Make proposed standards available at least 45 days prior to the hearing.
2. Give at least 30 days' notice of a public hearing and include in each hearing notice an announcement of the availability of the proposals.
3. Formulate proposed standards in understandable terms that relate to the air quality criteria issued by HEW.
4. Avoid revisions of proposed standards between the time of their issuance and the hearing—or if significant revision is necessary, reschedule the hearing to give adequate time for evaluation of the new proposals.
5. Release both the notification of a public hearing and the proposed standards themselves to the general media in the region—newspapers, radio and television—as well as to the often obscure publications used for official notification.

Keep in mind, too, that the federal *Guidelines* suggest that the public hearings be held sufficiently in advance of the date for submission of standards to HEW to give the state enough time to consider and respond to the views of the public expressed at the hearing.

FEDERAL REVIEW AND APPROVAL

The state must send a single copy of the transcript of the hearing along with the proposed standards to HEW. To be approved, the standards must satisfy three key requirements:

1. They must be consistent with the broad intent of the Air Quality Act: ". . . to protect and enhance the quality of the Nation's air resources."
2. Standards for a given pollutant must be consistent with the air quality criteria for that pollutant.
3. Standards must reflect particular consideration of their public health implications.

In determining whether the proposed standards meet these requirements, HEW will examine the transcript of the hearing. What you and other citizens have said about the proposals becomes a truly important factor.

If approved by HEW, the proposals become the official standards for air quality in your region.

IMPLEMENTATION

By themselves, air quality standards will not reduce pollution in your community by so much as a microgram. To be effective, they must be properly implemented. To ensure this, the Air Quality Act requires each state to submit a blueprint of its plan for attaining air quality standards for each of its regions. These implementation plans must include all the steps to abate and control pollution from existing sources in a region and to prevent urban and industrial growth from adding to its pollution problems.

The Act also specifies that standards must be reached within a "reasonable" period of time. Every implementation plan must include a timetable for obtaining compliance with the projected requirements for the prevention, abatement and control of pollution. Each plan must also include provisions for emergency conditions, for enforcement, and for a surveillance system.

Although the implementation plan is the most vital segment of the control process, there is no requirement for public participation in this stage. States, however, may elect to hold hearings on these plans, and you should encourage your state to do so. But even if a state does not hold a public hearing on its implementation plan, citizens should request copies and ask the state agency to explain exactly how the plan will achieve approved air quality standards.

The humblest citizen of all the land, when clad in the armor of a righteous cause, is stronger than all the hosts of error.

Willliam Jennings Bryan, speech at the National Democratic Convention, 1896.

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get the word out

Let it be known that you intend doing something about the air pollution problem in your community. Once the word is out, you may be surprised to find how many allies you have. Indeed, there is a convincing body of evidence that people are generally fed up with dirty air, that they favor stringent pollution control and support measures necessary to obtain it. Public opinion polls testify to these attitudes. Another sure—though less scientific—indicator is that politicians unanimously acclaim the objective of cleaner air. The Air Quality Act of 1967, for example, passed in both branches of Congress without a single dissenting vote.

SEEK OUT LIKE-MINDED CITIZENS

Translate your interest in air quality into action. Begin by identifying

WHAT DOES THE PUBLIC THINK?

Seventy-three percent of Americans are willing to pay additional taxes earmarked to improve their natural surroundings, according to a Gallup national public opinion survey conducted for the National Wildlife Federation.

George Gallup, Jr., speaking to delegates to the 33rd annual meeting in Washington, D.C., reported those willing to pay more taxes represented *all* income groups—including 63 percent earning less than $5000 per year. . . .

Air and water pollution grabbed the spotlight as the most pressing environmental problems [according to] 68 percent. . . .

National Wildlife Magazine, April-May 1969.

others who feel as you do. Often you will find local groups that have formed to meet a specific air pollution problem, such as the smoke from a particular plant or the soot from the city incinerator. Or air quality groups may be organized around voluntary health programs or conservation goals. Such local efforts most frequently focus on the local or state official control program. But whatever their rallying point, such groups will have information and experience to share. Join.

FORGE A COALITION

Since the Air Quality Act is now the best hope citizens have for cleaner air, try to bring existing air pollution control groups to focus on the processes of the Act. The law's success, however, requires support from a strong alliance of citizens representing the full range of your community's interests. Thus, a coalition of existing civic interests offers the best chance for maximum citizen influence when key decisions regarding air quality in your region are made. There is strength in numbers—and in diversity, too—and this is the principle upon which the best coalitions are based.

Perhaps such a group already exists. If so, join forces with it. In many of the cities already designated as air quality control regions, coalitions of citizens for clean air have been formed. These groups are working actively to make the Air Quality Act work in these areas, and their experience will be useful to you. (See page 96 for a partial list of these organizations.)

If a clean air coalition does not exist in your area, put one together. It will take time and hard work, but in most communities the elements for an effective organization are there, waiting to be pulled together. There will always be people willing to help you. NAPCA's office of education and information has a field services division which can offer assistance to citizens in air quality control regions. (See page 98 for address.)

In forming any coalition, make sure you have a broad base. Seek support from a wide range of citizen-interest groups (see page 92 for a partial listing). A coalition which represents only one social, economic or political group in the community will not be as effective in working for strong pollution control measures as will one which represents every major segment of the community. The appeal of the air quality issue is its universality. Everyone breathes the same air, so

everyone has the same stake in cleaning it up and can legitimately be approached for support.

Since your air quality standards will govern the character of the air in your entire metropolitan area, be sure that your coalition membership geographically reflects the regional nature of the problem and the control process outlined in the Act. Often several counties and other political subdivisions will be incorporated into the region; in many places, the control region will include parts of two or more states. (Chicago's region, for example, includes parts of Indiana; Philadelphia's includes parts of Delaware and New Jersey.) To ensure maximum effectiveness, the coalition should include organizations and individuals representative of every major political subdivision within the region.

Try to choose allies from those who know a great deal about air pollution and from those who have experience in citizen organization and action. To be effective, you will need the help of experts in both fields. In most large communities, you will be able to identify scientists and other professional persons whose work has some relation to air pollution and who possess the ability to communicate with laymen about air quality issues. Educational institutions are particularly good sources of talent; high school and college science teachers, professors of public health, etc., are able to provide objective advice.

Those employed professionally in the control field—although usually well-intended—are to some extent caught in the middle of any struggle for clean air. You will find, most often, that they already have a complete set of answers to the problems. These may or may not be right, so you should seek an independent evaluation before accepting them. Hence it is most useful to support citizen efforts with informed judgments from "outside" experts. Often the latter derive much pleasure from their involvement with laymen intelligently interested in clean air. They may have previously felt frustration at finding no effective channel for their informed concern; the active lay interest offers them a means to combat the problem with considerable force.

SOME TIPS ON ORGANIZING A COALITION

• *Keep it manageable.* Responsibility for direct action should be vested in a small group providing the leadership, coordination and information needed by the large number of individuals and groups

affiliated with the coalition. Broad, diverse representation is important, but take care not to make the organization unwieldy.

• *Don't expect the same level of commitment from everyone.* Many who are willing to associate with the coalition will not be able to contribute the same amount of time, energy and zeal that you are willing to give. Let each choose his own degree of involvement. Many of the civic group leaders who may join are among the busiest people in town. Rather than asking them to take up the cudgels full-time for clean air, request whatever they can do—however small—to help you. Often, just the use of their names or their organizations can lend strength and prestige to your program, opening doors that might otherwise be closed to you.

• *Recognize its limitations.* Coalitions are somewhat fragile organizations. Anyone who has ever arranged a church, civic or community event knows something about the difficulty of getting people—especially volunteers—to work together. People from drastically different backgrounds may work closely with each other for the first time. No precedents exist for decision-making or for resolving disputes. Highly motivated individuals or groups may hang back to avoid an appearance of "taking over." Personal conflicts, institutional rivalries and extraneous considerations of many kinds can prevent progress, even when everyone involved is sincerely committed to the aims of the program. The great diversity of groups in a coalition can magnify all these problems.

Most of these limitations can be offset if the coalition leaders foster an open and cooperative spirit among themselves and work to extend this to all the members. It is not necessary that everyone hold precisely the same views on air quality standards or on strategies for action. After all, it is the amount and the diversity of citizen interest in the air pollution problem that will help you reach the decision-makers—and this is your objective.

STRUCTURAL CONSIDERATIONS

Although elaborate organizational patterns are not essential to the success of the coalition, it makes sense to decide upon some orderly arrangement to conduct business. Presumably, you start with a willing band of activists and the latent support of many community organizations which have neither much time nor many resources to devote to air quality. Some of the main structural roles to be assigned include:

Chairman

This individual may be any qualified member of the community. Prior

knowledge of air pollution issues is not prerequisite. More important is demonstrated civic leadership in the community. Someone who has been through the wars on other community issues, has an understanding of organizational problems, and is willing to learn about air quality is likely to be a good choice.

Co-Chairmen

If you live in a region that encompasses more than one state, you may want to invite a resident of each to serve as co-chairmen. In such regions, public hearings may be called by the affected states at completely different times, and the standards proposed may vary considerably. The function of each co-chairman will be to monitor developments in his state on behalf of the regional coalition.

Secretary or Coordinator

Like most civic groups, clean air coalitions will be under-financed and dependent on volunteers. Telephoning, mailing and other paperwork are essential to a successful effort. One solution is to seek help from a local organization with a paid secretarial staff to assist with many of the clerical functions needed by your group. Voluntary health organizations and some conservation and civic groups may be able to furnish this kind of support (see page 92). Whatever arrangements you make, be sure to select a reliable, capable person who works well with others as secretary or coordinator. The finest analysis ever done of a state's proposed standards will do your coalition no good if the mail reaches members the day after the hearing.

Committees

A suitable committee structure grows naturally from the nature of the assignment your coalition has adopted. Most clean air coalitions will find they need:

- *Study Committee:* to analyze and evaluate the criteria and other scientific and technical information and proposed standards. Because of its technical demands, the group should have some "experts" serving on it. It might be chaired by a distinguished medical or scientific figure in the community. This group's major job will be to translate technical data into terms that are understandable and usable by the rest of the coalition.

- *Publicity Committee:* to take responsibility for informing and educating the community about its air pollution problems and control prospects. Here, again, enlist the help of professionals if you can. Experienced persons will know how to work with the communica-

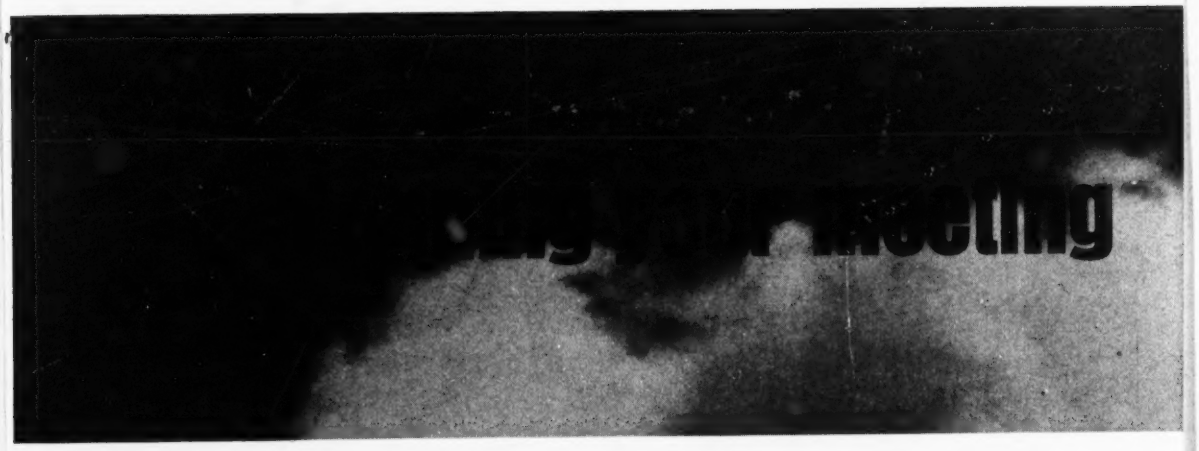
tions media in your community, how to present and time information releases, to stage press conferences or public information sessions, etc. You may find a local public relations or advertising firm willing to contribute its services or, at least, advice. Often, such firms are looking for worthy and interesting public service campaigns with which to associate.

- *Political Action Committee:* to apprise the appropriate governmental officials of your interest in clean air. Ultimately, stricter air control standards are going to have to find support at the city hall, the courthouse and the state house. Many elected officials will welcome your interest and the opportunities you present for their own understanding of and involvement in the clean air program. Quite obviously, their open support of your coalition's goals will boost your cause.

- *Communications Committee:* to prepare a system for rapid contacting of coalition members. A small group of the most active individuals can arrange for each to call three other members, who can in turn call three more. Such quick notice may become essential in certain circumstances, such as an unexpected strong turnout by organized polluters at a hearing previously regarded as routine, or sudden changes by the state in hearing place or time or proposed standards.

- *Financial Committee:* to help meet the costs of financing your coalition. Printing and mailing, telephone and other costs too often pose a serious problem. Membership dues may provide part of the needed operating money. Different amounts may be set for individuals and organizations (though dollar considerations should never be allowed to keep out those unable to pay but willing to contribute in other ways). Local businesses which profit from clean air, such as insurance companies and tourist services, may want to contribute. Your committee may design and sell bumper stickers and buttons which will both publicize and underwrite your campaign. Or you may rely on raffles, sales and solicitations.

One caution should be sounded here. Don't become involved in organizational or financial problems to the detriment of your goal. Keep your plans as simple and inexpensive as possible. Concentration on grandiose structures or glossy illustrated brochures can sap your energies and resources and turn your coalition into deadwood.



To build up and preserve popular participation in government at all levels is everywhere an acute problem. Education in the operation of grass-root democracy and solidarity with the community have nowhere reached such high levels that informal community controls have acquired anything like their maximum effectiveness.

Gunnar Myrdal, *Beyond the Welfare State*. New Haven and London, 1960.

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holding a meeting

Once organized, you must give focus and draw attention to your coalition effort for clean air. Plan to hold a workshop or training session to identify your cause and solidify your organization. Such a meeting will also inform and instruct your fellow citizens on the air pollution problems in your community. And a public meeting or workshop can furnish a rallying point around which other groups and individuals can gather.

Where strong clean air organizations already exist, workshop training programs provide a good way to expand and strengthen their activity and membership and to keep abreast of new developments in the field.

It will not be enough, though, to simply call people together to share your dedication to action for clean air. The success of such a meeting or workshop will depend greatly on the planning and development that go into it. Perhaps you or other coalition members have had ample experience in planning effective and informative programs. If so, you can dispense with the following advice. (There are far more sophisticated ways to organize and develop a program than are suggested here. Educational and training devices not generally available to or usable by many citizens could, if properly utilized, add immeasurably to your program. If you have such tools at your disposal or can enlist the talent to produce them, by all means do so.)

FINANCING

Once you decide on a program, the first problem you usually encounter is cost. Most citizen clean air organizations—like most civic groups—suffer from chronic underfinancing. Who will pay the bills?

You may find assistance from existing organizations in your com-

munity. Often, voluntary health agencies, conservation groups or labor unions will agree to provide money or manpower. Many times you will be able to reduce costs to a minimum by seeking contributions of goods and services from public agencies, industrial and commercial organizations, religious and educational institutions, etc. Public agencies, for example, should be able to supply free copies of much of the informational and training materials you wish to distribute to participants. Perhaps a local firm or business association will pay your printing costs in return for appropriate credit in your program or some other suitable acknowledgment. Religious or educational institutions may provide free meeting rooms. And so on.

It is also possible to make such meetings pay for themselves by charging a registration fee. This may be particularly necessary where the schedule involves food service. The fee may cover only the cost per person of the food service or that cost plus a prorated share of other meeting expenses. Try, however, to keep any registration charge modest. You do not want to discourage any individual or group from attending. To prevent this, you may wish to plan your budget so that the cost of participation by some is borne by others, by the planning committee, or by donations.

ORGANIZING YOUR MEETING

While there is no one formula for a successful meeting, the following tips may be useful.

Chairman

Every meeting needs a good chairman. Your program chairman may also be the person selected to lead the on-going clean air coalition—the qualifications are the same. In some communities, it may be desirable to have two chairmen. One would head the planning and follow-through groups. The second—often a well-known and influential local leader whose name on your program would attract attention and lend extra authority to your invitations—would chair only the meeting itself. This division of roles may help to obtain the cooperation of persons who would be an asset to your program but who are too busy to take an active part over the long haul.

Ordinarily, however, the chairman should be someone on the conference or workshop committee, rather than an outsider, since he plays an essential active role in keeping the meeting going as planned. To do so, he must know the details of the program.

Don't fail to give the chairman real authority. If your meeting—and your coalition—is to succeed, someone has to be in charge.

Invitations

Draw your audience from the broadest range of the civic leadership throughout your region. (See page 92 for a partial listing of civic interests from which you should seek representation.) Don't defeat your purpose by convening an audience overwhelmingly composed of persons interested only in a single aspect of the problem. Doctors, for example, have been talking about air pollution to each other for years. So have conservationists, from a different angle. Bring these—and other community interests—together to expand and support each other's viewpoints. And as far as possible, reflect this diverse representation in the composition of your invitations committee. Make sure that one of the persons on it knows the health interests in your community, another the community service organizations, another the conservation groups, and so on. But keep the committee small enough to work efficiently.

Take care not to destroy the educational nature of your training workshop or conference by turning it into a mass rally. Restrict attendance to invitees only. Keep in mind, first, that the group must be small enough to permit free discussion in an atmosphere of inquiry and exchange. Second, the careful balance you seek among the various civic and geographic interests should not be disturbed by opening up the meeting to anyone who cares to attend. (You may, however, wish to provide some special seating for observers from other jurisdictions or organizations who are invited to the proceedings as a matter of interest or courtesy, but not as active participants.) Third, if you invite and educate the leaders, they will be able to educate and involve the membership of their organizations. In any case, once you launch your action program, there will be ample opportunity for the fullest public involvement.

Time your invitations carefully. Depending upon accepted practice in your community, you should issue invitations three to five weeks in advance of the meeting. Notice too far ahead of the event may well cause many of your invitees to postpone a decision; naturally, many will forget the invitation. But too little notice may result in numerous "regrets," since you are asking busy people to give up a block of their time, for which they may have to make early arrangements.

Before mailing your invitations, check and recheck the names, titles and addresses to make sure they are correct. Each invitation should contain a letter explaining your program (and your organization, if it is not widely known in the community), a fact sheet giving all necessary information in a convenient form, and a stamped self-addressed return card which enables the invitee to indicate clearly whether or not he will attend, or what portions he will or will not attend. It's a good idea to number these return cards in some inconspicuous way and keep a master record of the numbers, for several people will invariably forget to write their names on the cards they return. (See page 90 for a sample invitational mailing.)

As returns come in, you will want to monitor them systematically for several purposes. Naturally, check the number of acceptances to be sure of reaching the audience size you desire. If acceptances are fewer than expected, send out a follow-up invitation or invite additional people. A poor turn-out can discourage speakers and participants alike.

Examine the returns for any gaps in the pattern of responses. Check not only the "regrets" but also the absence of any response. If no labor organizations, for example, indicate an intention to attend, redouble your efforts to attract them. In most cases, the reasons for lack of response are minor conflicts rather than a lack of interest in air quality. A phone call, a special letter or visit will usually ensure the organizational balance for which you are aiming.

Give the same attention to the geographic distribution of the responses. Don't let any part of your air quality region be unrepresented at your first meeting.

Selecting a Date and Site

In choosing the date of your meeting, give yourself plenty of time for preparation. Ideally you should allow at least two, and probably three, months for pre-meeting arrangements. Choose the day of the week carefully. Since customs and work schedules vary from one community to another, check with other organizations on their experiences. In some places, a weekday will best serve your purpose; in others, an evening or weekend date might work best. Before you select a particular date, check it against a calendar of community events to make certain it does not conflict with other major civic meetings, holidays, etc.

In selecting a site, secure a room that will seat the size audience you expect, but not many more. Anyone who has had experience with the dynamics of group meetings will counsel you that it is far better to crowd your audience a little than to spread them out in too large a room. For example, if you scatter 50 persons in a large auditorium, the emptiness of the rest of the room and the acoustical difficulties will dampen the best program.

Commercial meeting facilities operated by large hotels and motels are frequently available without charge if your meeting includes a dinner or luncheon served by the establishment. Or schools, universities and religious institutions may be able to provide you with appropriate meeting space at no charge. Often a cafeteria or other food service facility is available in these institutions to serve meals at prices more moderate than those of commercial establishments.

Whatever facility you choose, be certain its personnel are experienced in conference management. If meeting arrangements are their business, they have usually anticipated and eliminated most of the mechanical foul-ups that can take the edge off an otherwise well-planned meeting.

PLANNING YOUR WORKSHOP PROGRAM

Probably the first requirement here is to consciously resign yourself to the limitations that confront you. These are serious ones, for you have—at most—a few hours in which to inform a disparate lay audience about one of man's most complex and perplexing problems and to brief them on the procedures of one of the more complicated and cumbersome federal laws. On top of this, you may often find that your audience wants to seize the opportunity to complain about some aspect of the air pollution problem which bothers them particularly, such as a specific emission source, some malfeasance on the part of a local control agency, or about related problems such as water pollution or solid waste disposal.

None of this means that your meeting will be a failure. It does mean that very careful planning must go into the program. You might form a special committee for this purpose.

Organizing the program around some major questions will probably provide the most logical structure. You may want to consider these:

- What are the facts of air pollution?

SAMPLE WORKSHOP PROGRAM

9:00 - 9:30 am	Coffee and Registration
9:30 - 9:45 am	Welcome—the Workshop Chairman
9:45 - 10:00 am	Setting the Stage—Spokesman for the sponsoring organization
10:00 - 10:30 am	Air Pollution: The Facts—Keynote by a distinguished expert in the field
10:30 - 11:00 am	Federal Responsibility in Air Pollution Control—Exposition of the Air Quality Act by a federal spokesman
11:00 - 11:20 am	The Problem of Air Pollution in the . . . . . Region—Description by a local scientist or control official
11:20 - 11:45 am	Questions from the audience
Noon - 1:30 pm	Luncheon and Speaker—The Role of the Public in Achieving Clean Air
1:30 - 2:00 pm	How Citizens Become Informed and Organized for Action—Presentation by experienced citizen leaders
2:00 - 2:30 pm	Questions from the audience
2:30 - 3:30 pm	A Citizen Action Program for the . . . . . Air Quality Region—General discussion
3:30 - 3:40 pm	Summary—the Workshop Chairman
3:40 pm	Adjournment

(Optimal Number of Participants: 85-125 persons)

- What are the problems in your community?
- What is being done to solve them?
- What can the citizen do to help?

What Are the Facts?

Don't assume that the participants are already experts about air pollution. Even though they are sufficiently concerned to attend your meeting, there is still much information they will need. Start with an objective general review of the problem as background for the rest of the program. This initial review will set the stage for the speakers that follow.

The speaker who undertakes this review should probably be someone already well versed in the subject, such as a medical or physical

scientist from a local college or university or from outside the community. If you need help in locating such a speaker, write one or several of the organizations listed on page 99 requesting their advice and assistance.

Films and publications (see page 100 for a listing) can help to supplement this presentation or even, if you cannot find a suitable speaker, to provide the information needed by your audience.

What Are Your Air Pollution Problems?

Pages 33 to 34 contain information to help you discover how serious your air pollution problems are. This information should be clearly presented in your program, perhaps by a state or local control official who should be most familiar with the regional situation or by a scientist. This speaker should be expected to report what pollutants are present, in what quantities and from what sources. You want to prepare your audience to weigh this information against the federal criteria that describe the harm occurring at various levels of pollution.

What Is Being Done?

Invite spokesmen representing government control agencies operating in your region. Include a spokesman from NAPCA, probably one from the regional office which services your state. The NAPCA spokesman should describe how and when the Air Quality Act will affect your community. State and local officials should briefly describe their programs. But in most regions citizens will find that the strongest and most systematic approach to control will be based on the federal Act. For the sake of clarity, urge that all control officials focus on its application.

What Can the Citizen Do?

For this information, you should rely on the experience of tested citizen leaders. Your community may already have individuals who have been heavily engaged in the air pollution struggle. Their knowledge will be invaluable. If the air quality effort is just beginning in your area, try to locate a citizen leader from another community to relate his experiences to your group. Most communities possess civic leaders who have been working as volunteers on environmental, health or educational problems. These leaders, although not familiar with the specifics of the air pollution issue, can advise on techniques and strategies for citizen action.

As a model, you might try to present a speaker on the role of citizen action in air pollution control, followed by a specific "how-to-do-it" panel discussion by a diverse group of experienced civic leaders. In any event, allow plenty of time for questions and answers and for general discussion by the audience. Never crowd your program. Many speakers and topics will result in superficiality and in audience exhaustion.

RESOLVING THE ISSUES

The success of your meeting depends on a number of things which vary from one community to another. The seriousness of the problems, the level of citizen interest and knowledge, the direction and effectiveness of existing control efforts—all these and other factors will govern the response of your group. As a general guide, however, seek to determine where your region stands in regard to the steps outlined by the Air Quality Act. The Blueprint on page 104 will help you outline immediate goals to plan for. Seek the maximum protection available under that law by designing an action program to support its processes.

And, of course, seek to stimulate a continuing citizens' campaign for clean air.

the follow-through

planning an action program

The mobilization of a broad-based, area-wide coalition of informed, enthusiastic citizens represents a giant step forward in reaching your ultimate goal of clean air. But it's only the beginning.

The next step is to enlist the support of the entire community in reaching the next major interim objective—participation in the public hearing. Experience has shown that hundreds of citizens are genuinely alarmed at the rapidly increasing dangers of environmental pollution. They want information and welcome an opportunity to channel their individual concern into effective action. A reasonable amount of effort will broaden and strengthen the coalition's constituency and, therefore, its impact.

SOME SPECIFIC SUGGESTIONS

Your group may wish to undertake some of the following outreach activities that have proven successful.

1. Sponsor a public mass meeting to attract newcomers and acquaint them with the nature and purpose of the coalition, the problems of air pollution, the tools at hand, and the action they—together with others—can take to achieve clean air.

2. Get the issues on the program agenda for regular or special meetings of local clubs and organizations: church groups, PTA's, political organizations, union groups, professional societies, civic, inner-city, consumer and other associations.

3. Organize a speakers' bureau and, if possible, a film and publications center to meet information demands.

4. Urge local radio and TV stations to provide better coverage of the issue. Encourage interviews, use of films and film-strips, documentaries, etc. Aim for prime-time viewing. Stress your region's problems.

5. Invite area newsmen and broadcasters to an in-depth briefing pro-

gram to acquaint them with the underlying issues of air pollution control, especially with those aspects that often get little attention in daily news reporting, such as the long-term ecological aspects. Many times reporters and newscasters simply have not been exposed to the background information they need.

6. Sponsor or stimulate seminars in your local schools and colleges. Involve the academic community, both faculty and students, in leadership roles. Here is an opportunity to depart from the hard facts of air pollution (such as the control machinery, etc.) and consider some of the broader social, economic, political and ecological aspects of the problem.

7. Invite local elected officials—city councilmen, state legislators, etc.—to a special briefing on area air quality developments. Key your program to the special interests and needs of this group by focusing on the public administration aspects of pollution control. Discover just how the politician actually views the issue and the participation of groups such as yours in the field.

8. Stimulate religious groups to consider the moral aspects of air pollution. Enlist the cooperation of the Council of Churches, the Catholic Diocese, the Jewish Community Council. Ideally, a special briefing should be presented for the combined clergy of the area as a basis for individual sermons. Probably the best timing for the message to emanate from every pulpit and lectern in the region would be one or two weeks prior to the public hearing.

9. Establish contact with other clean air coalitions around the country. Place them on your mailing list and ask to be included on theirs. Exchange ideas and tactics that prove successful, materials you find useful, analyses, position papers, studies and surveys prepared by your committees. Ask advice on problems you find particularly difficult.

In addition to organization-sponsored activities, there are endless opportunities for individuals to expand the group's outreach. Members should be encouraged to promote your cause in accordance with their individual interests and talents. Some of the possibilities for immediate and long-range personal action are:

1. Write letters to local newspapers, including neighborhood papers. Raise the issues, ask questions, and state opinions.

2. Participate in local radio "talk shows." Call in to discuss pertinent issues, announce meeting dates, etc.

3. Talk to your doctor. Ask him what effects he has noted on patients with respiratory diseases on days with high pollution levels. Ask what his professional societies are doing. Would he like to become a mem-

ber of the coalition? Would he be willing to speak on air pollution and health?

4. Write your political representatives at all levels. Raise the issues, present your views, and request that they make their views known to you. Such letters are particularly important and effective when decisions about air pollution control (e.g., adoption of standards and implementation plans, budget appropriations) are pending.

5. Send for publications and materials offered by government agencies, by conservation, health, industrial, business, scientific and other organizations. Make them available to your friends, neighbors, colleagues, clubs, schools, church groups, etc. (See page 100 for a listing of films and publications.)

6. Ask your public library to create a special collection of materials on air quality and other environmental issues and to advertise their availability.

The success of any outreach activity is directly proportional to the publicity it receives. The coalition's Publicity Committee has a special responsibility to ensure as large an audience as possible in such undertakings; it should prepare the appropriate media contacts well in advance of any event you sponsor, plan the campaign and design the materials with special attention to timing and target audience. Media coverage of the event itself will follow quite naturally if the advance campaign is properly carried out. Don't, however, insist that your organization be the focus of all publicity. It often profits you far more if the media concentrate on the issues and the prospects.

RELATIONS WITH THE COMMUNICATIONS MEDIA

The citizen must rely on the mass media with their inevitable editorial biases in selecting what news to present. Organizations with sufficient money can *buy* time and space in the mass media to get their message across; but the citizen group must usually rely on the mimeograph machine, word of mouth, and small meetings.

So you should urge your local newspapers, magazines, radio and television stations to pay as much attention to your organization as to the government or the corporation press release. Ask them not merely to cover your activities, but to help uncover the local problems and pinpoint the sources of pollution. Provide local news media with sources of medical information and of the solutions offered by current technology. In most cases, reporters are eager to help; it's more often the editor or publisher who kills a story. Sometimes editors will say that a group of citizens meeting to try and clean up the air is not news. Such editors are rarely interested in all the quiet law-abiding citizens who try to build and improve the community, yet many of them would send reporters rushing if the citizens formed a picket line. Thus, if you prefer to discuss these matters in a rational, law-abiding manner, you sometimes cannot get your message through.

Another problem arises when newspapers or broadcasters don't want to cover a story which may embarrass one of their advertisers. And yet, media's essential role in a democracy demands that they fulfill their highest duty of informing the citizenry about vital community issues. So ask your local media to present all sides of the pollution problem fairly and give adequate time to responsible presentation of views opposing their own or those expressed in their programs.

Mrs. Hazel Henderson, Conservation Chairman, National Council of Women, address to the Citizens Air Quality Workshop, Louisville, Kentucky, December 6, 1969.

summing up... and a look ahead

Our only hope is that a sufficiently large number of people will become actively concerned about the destruction of the environment. . . . If a sufficiently powerful group of people understand . . . (they) can lead the rest. . . .

Walter Lippmann, on the occasion of his 80th birthday.

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summing up

The achievement of clean air in each region of the country depends largely on the stringency of the air quality standards adopted and on the effectiveness of the implementation plans. These, in turn, usually depend directly on the degree of citizen concern and pressure in each region.

Citizen workshops have sparked much community interest and action on air pollution problems and ways to combat them. Held in many cities, workshops have been attended by representatives of professional, labor, health, civic, women's, consumer, conservation, youth, minority, ethnic, religious, political and industrial groups, as well as by the press. These educational sessions have been organized and sponsored by the League of Women Voters, by affiliates of the National Tuberculosis and Respiratory Disease Association, by The Conservation Foundation, and by other organizations with the assistance of APCA.

These workshops have generally led to the formation of a citizens' coalition or coordinating committee. In some regions, an existing clean air group has carried the fight. In others, a new organization has been created. And, of course, public understanding of the air pollution problem has been greatly advanced by media coverage and by the educational programs of some control agencies.

As a result of these efforts, many citizens are taking advantage of the opportunity provided by the Air Quality Act to have a voice in determining how clean the air will be in their own regions. They are studying proposed standards, attending public hearings held by the states, and speaking out for clean air. Their views are being included in the public hearing transcript which a state must submit to EPA

along with its proposed standards, thus allowing HEW to consider the public's point of view during its evaluation of proposed air quality standards.

DOES CITIZEN ACTION PAY OFF?

This applied democracy has had dramatic results. Some examples:

In *Pennsylvania*, the Air Pollution Commission originally proposed standards which were lax compared with the federal criteria. Public reaction was explosive. A special target was the commission's proposal to allow an annual average level for particulate matter of 100

"Breathers' Lobby" Wins Pollution-Fight Round in Key Industrial State

PITTSBURGH—Several years ago Francis O'Toole, a long-time employee at the Monessen, Pa., works of Wheeling-Pittsburgh Steel Corp., found himself constantly and frighteningly short of breath. The diagnosis: Emphysema, the crippling disease involving destruction of the air cells in the lungs.

Three years ago Mr. O'Toole had to retire prematurely. Now 61, he lives across the road from the Wheeling-Pittsburgh plant, located 35 miles south of this city. He is bitter about his ailment. "I attribute it to air pollution," he says flatly.

Pollutants from the plant may or may not have caused Mr. O'Toole's disease. But one day last month he put his bitterness into action. He joined a curious coalition of unionists, conservationists, health societies, ladies' garden clubs, and college-age militants—the so-called breathers' lobby—and journeyed to Pittsburgh for a public hearing of the state air pollution commission.

The hearing, called to discuss what kind of pollution control standards Pennsylvania should adopt, had been scheduled for a small state office. But nearly 500 persons showed up, and startled officials hastily changed the location to a big auditorium. Representatives of the steelmakers, coal producers and other big industries also were startled by the turnout, largely hostile to their position.

In succeeding days, the breathers' lobby kept the pressure on, at another hearing and through the mails. Yesterday it won a victory that may have repercussions in many other states. Meeting in Harrisburg, the capital, the commission recommended that Pennsylvania's air pollution limits be made [among] the most stringent in the nation. . . .

The Wall Street Journal, October 11, 1968

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micrograms per cubic meter of air, with a long-range goal of 80 micrograms. But citizens noted with dismay that the federal criteria report shows that increased death rates have occurred among persons over 50 years of age when particulate matter exceeds 80 micrograms per cubic meter (in the presence of sulfur dioxide).

Citizens responded with a deluge of protests and letters to the commission and turned out more than 450 strong at a public hearing in Pittsburgh on September 9. Meanwhile, a bipartisan group of 14 Pennsylvania congressmen wrote Governor Raymond P. Shafer, urging him to ask the commission to reconsider its proposed standards. The governor did call for tougher standards, and on October 20 the state commission made striking changes in its recommendations. Among them was a proposed annual average for particulate matter of 65 micrograms per cubic meter—far below the 100 micrograms first suggested.

There is little doubt that the commission was swayed by the public testimony and mail, which also influenced the governor's position.

The situation was similar in Illinois. For the Chicago air quality control region, the Illinois Air Pollution Control Board proposed standards containing weaknesses. Several citizen coordinating committees were set up to fight for tougher standards. Some 1,800 letters were sent to the board. There was considerable press coverage. An estimated 300 persons showed up at the public hearing. Citizens were particularly aroused by the board's 1976 deadline for meeting standards. Industry witnesses sought an extension, but the public wanted their air cleaned up sooner. In the end, the board moved the deadline up to 1972. It also tightened several other proposals that had been heavily criticized. Again, public pressure played a key part.

[redacted]

The public is not invariably opposed to the standards proposed by state agencies. Proposals by New Jersey, Maryland, Kentucky, Colorado and the District of Columbia have all received endorsement (with minor reservations) by citizen groups, and officials in those states and others like them can look forward to continuing citizen support in the development of strong implementation plans and effective enforcement measures.

[redacted]

In *Virginia*, the Air Pollution Control Board proposed an annual average of 80 micrograms per cubic meter for particulate matter and an annual geometric mean of 0.05 parts per million for sulfur oxides. After adamant citizen opposition at the public hearing, the standards were set at 60 micrograms and 0.02 parts per million, respectively.

There are numerous other examples of citizen impact. *Indiana*, *Delaware* and *Ohio*, to name a few states, have all adopted tighter standards in response to citizen demands, including strengthened anti-degradation clauses, shortened timetables for achievement, and promises of public or open hearings for implementation plans.

The successes have not always been easy, however. Citizens have found many potholes on the road to clean air. Some careful steering has been necessary. For instance:

- In some states the air quality authority views citizen involvement with cynicism or resentment. Some agencies have given citizens little chance to see or study proposed standards prior to the public hearing or have otherwise frustrated effective involvement.
- In many states, citizens have criticized pollution control agencies for having lopsided industry-oriented membership. For example, citizens have questioned the propriety of having a steel company executive as chairman of the Pennsylvania Air Pollution Commission and another steel executive as chairman of the technical advisory group that wrote the commission's proposed air quality standards. In Milwaukee County, citizens have objected to the composition of the local board, all five of whose members represent industry. In Chicago, citizens have taken full-page newspaper ads to protest the fact that five of the city board's six members are representatives of industry or political appointees of questionable qualifications. And one woman has filed a lawsuit, charging that this composition of the board deprives her and other citizens of proper representation and due process under law.

Citizens recognize that industry representatives should be consulted. But they should not be the sole or even the chief policy-makers or architects of standards and implementation plans.

"Industries and other polluters such as municipalities still wield great influence, opposing or weakening regulatory laws and 'packing' regulatory boards with their own spokesmen."

The New York Times, October 15, 1969.

a look ahead

Experience shows that citizens are capable of making sound judgments about air quality and of participating effectively in the required public hearings. But it is essential that citizen leaders recognize the need for a continuing involvement beyond the public hearing. The establishment of good standards is only the first step toward achievement of clean air.

The next stage in the process, the development of implementation plans and their enforcement, is crucial. And it is fraught with perils. Setting emission standards and coordinating them to achieve the desired air quality will be even more difficult and complex than setting ambient air standards. The implementation stage involves such technicalities as process changes, flue gas stack controls, stack height requirements, fuel use limitations, plant location rules, etc. Many times, polluters will acquiesce in setting good standards, saving their real strength, their economic and political power for the implementation stage. They will argue forcefully for extended timetables, permissive variances, ineffectual inspection systems, weak fuel and process regulations, token fines for violators—poor implementation in general.

Never make the mistake of thinking a strong stand by citizens at standards and implementation hearings (if your state holds the latter) is enough to ensure adoption of stringent plans. Keep the pressure on after the hearing and after standards are adopted. Write to your governor, legislators, members of the air pollution control agency, the media, etc. Wherever possible, support your views with facts. Your coalition's technical advisory committee should provide a thorough evaluation of the state's proposals. But don't get mired in technical arguments. Focus on the important points your data (as

clean air for your community and the necessary utilization of ". . . the best available technology required to achieve the desired level of ambient air quality."*

ITEMS TO REMEMBER

The federal air pollution law does *not* require a public hearing on a state's implementation plan. But state or local law may require it. Or a state may voluntarily hold such a hearing. Request it.

The federal law sets no timetable for compliance with air quality standards. It merely states that standards shall be achieved "within a reasonable time." The obvious problem will be deciding what is "reasonable."

Dr. S. David Rockoff, representing a group called "Lung Specialists of St. Louis Against Air Pollution," warned at that city's public hearing on air quality standards: "The liberal use, or misuse, of variances weakens the local enforcement of even existing air pollution control laws. In private discussions with our group, some local officials have expressed their apprehension concerning the prospect of interminable court battles should they seek to close an offending plant. We sense this may have been a factor in the granting of some of the variances."

Still another problem is the question of penalties for violations of standards or enforcement plans. Many ordinances—and many courts—don't take air pollution offenses seriously. They give only token, wrist-slapping fines. Violators have been fined as little as $10 under current regulations in many places. In New York City, the average fine is about $25, according to testimony before a state legislative committee. Many polluters cheerfully pay such small penalties, preferring them to the cost of control. Strive to have strict penalties written into your state and local regulations.

* Federal Register, Vol. 35, July 10, 1970.

clean air: when?

The necessary first steps toward cleaner air have been taken under the Air Quality Act of 1967. Provisions of the Act are being put into motion, stage by complicated stage. Citizens are demonstrating that they care enough to become involved—and when they do, they are making an impact.

If the public pressure and commitment continue, and if the Act continues to be executed, there will be a reduction in pollution—in time. But the air around most of us keeps getting dirtier each day. Pollution levels in many cities are at or above concentrations which science tells us are damaging to our health.

The hope is that polluters and controllers will recognize the dangers and act in time. An aroused public can speed that recognition.

Union leaders protest to smoke at Cleveland's public hearing
source: "Plain Dealer," Cleveland, Ohio

appendices

glossary

Air contaminant—any substance of either man-made or natural origin in the ambient air space, such as dust, fly ash, gas, fumes, mist (other than H_2O), smoke, radiation, heat, noise, etc., which is not normally present in the atmosphere.

Air pollution—the presence in the ambient air space of one or more air contaminants beyond that which is natural.

Air quality control region—an area, whose boundaries have been defined by state, which shows a common air pollution problem due to meteorological, topographical, urban and industrial factors.

Air quality criteria—the documented levels of pollution and lengths of exposure at which, based on currently available scientific information, specific adverse effects to health and welfare are detectable.

Air quality standards—a limit on the amount of a given pollutant which will be permitted in the ambient air; the established goal for a region.

- *long-term standards*—as above, typically for one year and expressed as an annual average, often as an annual geometric or arithmetic mean.
- *short-term standards*—as above, for periods of time such as one day, one hour, five minutes, etc.

Alert levels—part of a warning system for air pollution episodes based on air quality data as well as meteorological factors, the final stage of which may call for immediate shutdown of all emission sources in the area.

Ambient air—the unconfined space occupied by the atmosphere; outdoor air. See: troposphere.

Anti-degradation clause—a provision in air quality standards to prevent deterioration of air quality in areas where the pollution levels are presently below those allowed by the standards.

Arithmetic mean—the sum of a given number of factors divided by that number, e.g., $3 + 6 + 7 + 9 = 25 \div 4 = 6.2$

$$\frac{a+b+c}{3}$$

Background level—amounts of pollutants present in the ambient air due to natural sources beyond man's control, e.g., marsh gases, pollen.

Carbon monoxide (CO)—a colorless, odorless, very toxic gas produced by any process that involves the incomplete combustion of carbon-containing substances such as coal, oil, gasoline and natural gas.

Carcinogenic—cancer-producing.

Chilling effect—the phenomenon in which the increase in atmospheric particulates inhibits penetration of the sun's energy, thus gradually lowering the temperature of the earth.

Coh—abbreviation for "coefficient of haze," one unit for the measurement of visibility interference.

Consultation report—a compilation of scientific data and other information on a given area (such as meteorological and topographical factors, urban-industrial concentrations, jurisdictional boundaries, etc.) developed jointly by federal, state and local officials, on the basis of which EPA determines the boundaries and official designation of an air quality control region.

Control techniques—methods, equipment and devices applicable to the prevention and control of air pollutants at their sources, such as process changes, flue gas stack devices, stack height requirements, fuel use limitations, plant location rules, etc. Also, the federal documents compiling such techniques.

Designation—an official action by EPA in accordance with the Air Quality Act of 1967 which establishes a geographic area as an air quality control region.

Ecology—the totality or pattern of the interrelationship of organisms and their environment; also the science which studies such patterns.

Ecosphere—the layer of earth and troposphere inhabited by (or suitable for the existence of) living organisms.

Effluent—an outflow; a discharge or emission of a liquid or gaseous nature.

Electrostatic precipitator—a device using electrical (rather than mechanical or chemical) attraction to collect particulates for measurement, analysis or control.

Emission inventory—a list of primary air pollutants emitted into the atmosphere of a given area in amounts (usually tons) per day, by type of source.

Emission standard—the maximum amount of a pollutant that is permitted to be discharged from a single polluting source.

Environment—the aggregate of all the external conditions and influences affecting the life, development, and ultimately the survival of an organism.

Epidemiology—the study of diseases as they affect populations rather than individuals, including the distribution and incidence of a disease;

mortality and morbidity rates; and the relationship of climate, age, sex, race, income, job, smoking habits, and other factors.

Episode—an air pollution incident in a given area caused by a concentration of atmospheric pollution reacting to prolonged meteorological conditions (e.g., an extensive inversion) that results in a significant increase in deaths and illnesses.

Fossil fuels—coal, oil and natural gas; so-called because they are the remains of ancient plant and animal life.

Geometric mean—the Nth root of the product of N factors (N = number of factors), e.g., $3 \times 4 \times 5 \times 6 = \sqrt[4]{360} = 4.35+$. Geometric means are often lower than arithmetic means.

Greenhouse effect—the phenomenon in which the sun's energy, in the form of light waves, passes through the atmosphere and is absorbed by the earth, which then radiates the energy as heat waves that the air is able to absorb. The air thus behaves like glass in a greenhouse, allowing the passage of light while trapping heat.

Heating season—the coldest months of the year during which pollution levels are highest as a result of increased consumption of fossil fuels.

HEW (DHEW)—the Department of Health, Education and Welfare in the federal structure of the U.S. Government.

High-volume sampler—also called a Hi-Vol. A device used in the measurement and analysis of suspended particulate pollution.

Hydrocarbons—any of a vast family of compounds originating in organic materials containing carbon and hydrogen in various combinations. Some may be carcinogenic; others are active participants in photochemical processes in combination with oxides of nitrogen.

Implementation plan—a blueprint of the steps that will be taken to ensure attainment of air quality standards within a specified time period.

Inversion—the phenomenon in which a layer of cool air is trapped by a layer of warmer air above it so that the bottom layer cannot rise.

Margin of safety—the difference between an allowable level for a given pollutant and the criteria level at which adverse effects have been noted, assuming the allowable level is numerically lower. Significance is usually determined by units of 5, e.g., 75 ug/m³, 80 ug/m³, 85 ug/m³, ——

Mean—one kind of average; an expression of central tendency. See arithmetic, geometric mean.

Micrograms per cubic meter (ug/m³)—a weight per unit volume measurement for suspended particulate matter. Micro is a prefix meaning 1/1,000,000 of a gram.

Monitoring—continuous sampling by local, state and regional agencies as part of a surveillance system for measuring pollutants present in the atmosphere.

Ordinance—a statute enacted by the legislative body of a local, generally a municipal, government.

Oxide—a compound of two elements, one of which is oxygen.

Ozone (O_3)—a pungent, colorless, toxic gas; one component of photochemical smog.

Parts per million (ppm)—a volume unit of measurement; the number of parts of a given pollutant in a million parts of air.

Photochemical process—the chemical changes and interactions brought about by the radiant energy of the sun acting upon foreign substances in the air. Results in smog.

Ringelmann chart—a series of charts, numbered from 0 to 5, for measuring the density of black smoke arising from stacks and other sources (5 being most dense; and 0 least dense); often used in setting emission standards.

Scrubber—a device that uses a liquid spray to remove aerosol and gaseous pollutants from an air stream; used for both measurement and control of pollution.

Smog—the irritating haze resulting from the sun's effect on certain pollutants in the air, notably those from automobile exhaust. (Also a mixture of smoke and chemical "fog".)

Sulfur dioxide (SO_2)—a heavy, pungent, colorless gas formed primarily by combustion of coal, oil and other sulfur-bearing compounds, but also produced in chemical plants and by processing metals and burning trash.

Surveillance system—a required part of implementation plans, established to monitor all aspects of progress toward attainment of air quality standards and to identify potential episodes of high pollutant concentrations in time to take preventive action.

Synergism—the cooperative action of separate substances such that the total effect is greater than the sum of the effects of the substances acting independently.

Troposphere—the innermost part of the 12-mile layer of air encircling the earth; it extends outward about 5 miles at the poles and 10 at the equator.

Timetable—a requirement of air quality standards indicating the time goal (number of years) for attainment, possibly with stated interim objectives for measurement of progress toward attainment.

Variance—sanction granted by a governing body for delay or exception in the application of a given law, ordinance, etc.

West-Gaeke method (modified)—a colorimetric technique for measurement of sulfur dioxide and sulfite salts which can be modified to compensate for interferences produced by the presence of nitrogen oxides, ozone, or heavy metal salts in the sample. (NAPCA prefers the modified method.)

air quality control regions

Region	*State(s)*
WASHINGTON, D.C.	District of Columbia Maryland Virginia
NEW YORK CITY	Connecticut New Jersey New York
CHICAGO	Illinois Indiana
PHILADELPHIA	Delaware New Jersey Pennsylvania
DENVER	Colorado
LOS ANGELES	California
ST. LOUIS	Illinois Missouri
BOSTON	Massachusetts
CINCINNATI	Indiana Kentucky Ohio
SAN FRANCISCO	California
CLEVELAND	Ohio
PITTSBURGH	Pennsylvania
BUFFALO	New York
KANSAS CITY	Kansas Missouri
DETROIT	Michigan
BALTIMORE	Maryland
HARTFORD-SPRINGFIELD	Connecticut Massachusetts

Region	*State(s)*
INDIANAPOLIS	Indiana
MINNEAPOLIS-ST. PAUL	Minnesota
MILWAUKEE	Wisconsin
PROVIDENCE	Massachusetts Rhode Island
SEATTLE-TACOMA	Washington
LOUISVILLE	Indiana Kentucky
DAYTON	Ohio
PHOENIX	Arizona
HOUSTON	Texas
DALLAS-FT. WORTH	Texas
SAN ANTONIO	Texas
BIRMINGHAM	Alabama
TOLEDO	Michigan Ohio
STEUBENVILLE	Ohio West Virginia
CHATTANOOGA	Georgia Tennessee
ATLANTA	Georgia
MEMPHIS	Arkansas Mississippi Tennessee
PORTLAND	Oregon Washington
SALT LAKE CITY	Utah

Region	*State(s)*
NEW ORLEANS BEAUMONT-PORT ARTHUR	Louisiana Texas
MIAMI	Florida
OKLAHOMA CITY	Oklahoma
OMAHA	Iowa Nebraska
HONOLULU	Hawaii
CHARLOTTE	North Carolina South Carolina
PORTLAND	Maine
ALBUQUERQUE	New Mexico
LAWRENCE-LOWELL-MANCHESTER	Massachusetts New Hampshire
EL PASO	Texas New Mexico
LAS VEGAS	Nevada Arizona
FARGO-MOORHEAD	Minnesota North Dakota
BOISE	Idaho
BILLINGS	Montana
SIOUX FALLS	South Dakota
CHEYENNE	Wyoming
ANCHORAGE	Alaska
BURLINGTON	Vermont New York
SAN JUAN	Puerto Rico
VIRGIN ISLANDS	
ALLENTOWN-BETHLEHEM-EASTON-PHILLIPSBURG	Pennsylvania New Jersey
BINGHAMTON	New York Pennsylvania
BRISTOL-JOHNSON CITY-KINGSPORT	Virginia Tennessee
COLUMBUS-PHENIX CITY	Georgia Alabama
CUMBERLAND-KEYSER	Maryland West Virginia

Region	*State(s)*
DULUTH-SUPERIOR	Minnesota Wisconsin
YOUNGSTOWN-ERIE	Ohio Pennsylvania
EVANSVILLE-OWENSBORO-HENDERSON	Indiana Kentucky
FLORENCE-CORINTH	Alabama Mississippi Tennessee
FORT SMITH - MUSKOGEE	Arkansas Oklahoma
HUNTINGTON-ASHLAND-PORTSMOUTH-IRONTON	West Virginia Kentucky Ohio
JOPLIN-FAYETTEVILLE	Missouri Oklahoma Kansas Arkansas
LA CROSSE-WINONA	Wisconsin Minnesota
MENOMINEE-ESCANABA-MARINETTE	Michigan Wisconsin
MOBILE-PENSACOLA-GULFPORT	Alabama Florida Mississippi
PADUCAH-CAIRO	Kentucky Illinois
PARKERSBURG-MARIETTA	West Virginia Ohio
ROCKFORD-JANESVILLE-BELOIT	Illinois Wisconsin
SCOTTSBORO-JASPER	Alabama Tennessee
SOUTH BEND-ELKHART-BENTON HARBOR	Indiana Michigan
AUGUSTA-AIKEN	Georgia South Carolina
BERLIN-RUMFORD	New Hampshire Maine

Region	*State(s)*
DAVENPORT-ROCK ISLAND-MOLINE	Iowa Illinois
DOUGLAS-LORDSBURG	Arizona New Mexico
DUBUQUE	Iowa Illinois Wisconsin
KEOKUK	Iowa Missouri Illinois
LEWISTON-MOSCOW-CLARKSTON-PULLMAN	Idaho Washington
NORFOLK-ELIZABETH CITY	Virginia North Carolina
SAVANNAH-BEAUFORT	Georgia South Carolina
SHREVEPORT-TEXARKANA	Louisiana Texas Arkansas
SIOUX CITY	Iowa Nebraska
SPOKANE-COEUR D'ALENE	Washington Idaho
VICKSBURG-TALLULAH	Mississippi Louisiana
TULSA	Oklahoma

notes on pollutants

CLASSIFICATION OF POLLUTANTS *

Major classes	*Sub-classes*	*Typical members of sub-classes*
ORGANIC GASES	Hydrocarbons	Methane, butane, octane, benzene, acetylene, ethylene, butadiene
	Aldehydes & Ketones	Formaldehyde, acetone
	Other organics	Chlorinated hydrocarbons, benzopyrene, alcohols, organic acid
INORGANIC GASES	Oxides of nitrogen	Nitrogen dioxide, nitric oxide, nitrous oxide
	Oxides of sulfur	Sulfur dioxide, sulfur trioxide
	Oxides of carbon	Carbon monoxide, carbon dioxide
	Other inorganics	Hydrogen sulfide, hydrogen fluoride, ammonia, chloride
PARTICULATE	Solid particulates	Dust, smoke
	Liquid particulates	Mist, spray

* Modified from a table in *Elements of Air Quality Management*, U.S. Department of Health, Education and Welfare, August 1967.

WHAT WE KNOW ABOUT OXIDES OF SULFUR (SO_x)

Major source: fuel combustion

Minor sources: chemical plants, metal processing, trash burning

Nature: Sulfur is a nonmetallic element found in coal and fuel oil. When these fuels are burned, sulfur joins with oxygen in the air to form gaseous oxides of sulfur, including sulfur dioxide (SO_2) and sulfur trioxide (SO_3).

Effects: Sulfur oxides, in combination with moisture and oxygen, can

yellow the leaves of plants, dissolve marble, and eat away iron and steel. They can limit visibility and cut down the light from the sun. They can affect man's breathing: at sufficiently high concentrations, sulfur dioxide irritates the upper respiratory tract; at even lower concentrations, when carried on particulates, it appears able to do still greater harm by injuring lung tissue.

Conclusions found in the federal criteria: The criteria *Resumé* for sulfur oxides reports that increased mortality occurred when the annual geometric mean was as high as 115 micrograms per cubic meter. Adverse effects can be detected when SO_x pollution exceeds certain levels for short periods of time. These effects are especially evident in the case of sulfur dioxide. Levels of 300 micrograms per cubic meter of SO_2 for three or four days have been associated with a variety of adverse health effects.

WHAT WE KNOW ABOUT PARTICULATE MATTER

Source: Pollutants can exist as solid matter, liquid droplets, or gas. Both the solid and liquid matter are called particulates (which simply means particles in the atmosphere). Solid particulates consist of dust, smoke or fumes; liquid particulates are mists and sprays. Particulate pollution results from many kinds of industrial and agricultural operations and from combustion products, including automobile exhausts.

Effects: Particulate matter in the respiratory tract may produce injury by itself, or it may act in conjunction with gases, altering their sites or their modes of action. Particles suspended in the air scatter and absorb sunlight, reducing the amount of solar energy reaching the earth, producing hazes and reducing visibility. Particulate air pollution causes a wide range of damage to materials. It may chemically attack materials through its own intrinsic corrosivity or through the corrosivity of substances absorbed or adsorbed by it. Merely by soiling materials and thereby necessitating more frequent cleaning, particulates can accelerate deterioration.

Conclusions found in the federal criteria: The criteria *Resumé* reports that adverse health effects were noted when the annual geometric mean particulate matter level reached 80 micrograms per cubic meter, annual average.

WHAT WE KNOW ABOUT CARBON MONOXIDE

Major source: internal combustion engines in motor vehicles, primarily the automobile

Minor sources: various industrial processes, solid waste disposal

Nature: Carbon monoxide, an invisible, odorless, and tasteless gas, is formed when any carbon-containing fuel (gasoline, coal, etc.) is not completely burned to carbon dioxide (CO_2), but only half-way to carbon monoxide (CO). Because of its characteristics, the internal combustion engine, especially in cars, is responsible for by far the largest fraction of man-made emissions of carbon monoxide.

Effects: Compared to other common air pollutants, carbon monoxide has a unique mechanism of action. It does not irritate the respiratory tract but rather passes through the lungs directly into the blood stream. There it combines with the red blood cell's hemoglobin, the substance that normally carries oxygen to all the tissues of the body. Because hemoglobin binds carbon monoxide over 200 times as strongly as oxygen, a low concentration of carbon monoxide in the ambient air has a greatly magnified effect on the body. Since the heart and brain are the two tissues most sensitive to oxygen deprivation, they show the most serious effects from carbon monoxide exposure. Thus at high concentration (1000 ppm and more), carbon monoxide kills by paralyzing normal brain function. At much lower levels, effects on these two tissues are also the predominate ones (see below).

Because of its unique mode of action, carbon monoxide is not known to have adverse effects on vegetation, visibility or material objects.

Conclusions found in the federal criteria: The criteria *Resumé* reports that exposure to 35 mg/m^3 (30 ppm) will, after a few hours, inactivate about 5% of the blood's hemoglobin, thus lowering its oxygen content. This loss can impair performance on certain psychomotor tests, indicating a significant effect on brain function. At higher exposures, excess strain is put on patients with heart disease. Exposure to 12-17 mg/m^3 (10-15 ppm) for several hours also affects the brain by altering time interval discrimination. In addition, there is some very preliminary evidence that at even lower weekly average levels of carbon monoxide (9-16 mg/m^3 or 8-14 ppm), people hospitalized for heart attacks have increased death rates.

WHAT WE KNOW ABOUT PHOTOCHEMICAL OXIDANTS

Nature: Photochemical oxidants are several different pollutants (notably ozone and a group of chemicals called peroxyacylnitrates or PAN), which can come from several sources. All of these pollutants share three properties:

1. They are all formed by the chemical reaction of other pollutants ("-chemical").
2. The reactions forming them proceed much more rapidly in areas with intense sunlight ("photo-").
3. They are extremely reactive chemical substances, acting as oxidizing agents ("oxidants").

Among the most effective combinations for producing this class of pollutants are the oxides of nitrogen and reactive hydrocarbon (organic) vapors. Los Angeles, with its sunny climate and high number of cars, offers extremely good conditions for the production of photochemical oxidants, and in fact this pollution comprises the main part of that city's infamous smog. It is not confined to Los Angeles, however. The constitutents of photochemical smog can now be readily detected in many metropolitan areas.

Effects: The various components of photochemical oxidants can have several adverse effects. First, they can directly affect the lungs and eyes of people, causing respiratory irritation and possibly changes in lung function, as well as subjective eye irritation. They are extremely toxic to many kinds of plants, affecting primarily the leaves. In addition, they can physically weaken such materials as rubber and fabrics.

Conclusions found in the federal criteria: The criteria *Resumé* for photochemical oxidants reports impairment of the performance of student athletes occurred over a range of hourly oxidant levels from 60-590 $\mu g/m^3$ (0.03-0.3 ppm). Increased frequency of attacks in some people with asthma have been observed when hourly averages, as determined from peak measurements, were 100-120 $\mu g/m^3$ (0.05-0.06 ppm). Eye irritation occurs in people at once upon exposure to about 200 $\mu g/m^3$ (0.10 ppm); this is roughly equivalent to an hourly average of 60-100 $\mu g/m^3$ (0.03-0.05).

Adverse effects on vegetation have been noted at levels of about 100 $\mu g/m^3$ (0.05 ppm) maintained for four hours. Damage to ma-

terials, while clearly observed at levels present in many cities, has not been accurately quantitated at this time.

WHAT WE KNOW ABOUT HYDROCARBONS

Major source: internal combustion engines in motor vehicles, primarily the automobile

Minor sources: evaporation of organic solvents (from painting, dry cleaning, etc.), agricultural burning, gasoline marketing

Effects: At levels of hydrocarbons currently measured in urban areas, no adverse human effects are known to be caused by the hydrocarbons in isolation. However, as discussed in the section on photochemical oxidants, hydrocarbons are an extremely important component of photochemical oxidants, whose effects have been observed. Thus the effects of photochemical oxidants can be, in part, traced back to the hydrocarbons. These, outlined earlier, include respiratory irritation, plant damage, and damage to materials.

Certain specific hydrocarbons do have other effects. Ethylene, for example, damages plants; it can inhibit growth and cause the leaves and flowers to fall.

Conclusions found in the federal criteria: The criteria *Resumé* clearly states that damaging levels of photochemical oxidants are directly related to concentrations of hydrocarbons in the air which are, if alone, without effect. The *Resumé* states that hydrocarbon concentrations (excluding methane) of 200 $\mu g/m^3$ (0.3 ppm as carbon) for three hours may produce photochemical oxidant levels of up to 200 $\mu g/m^3$ (0.10 ppm) a few hours later. If the relationship holds true at lower levels of photochemical oxidant known to be damaging, the hydrocarbon concentration that may be associated with adverse effects is about 100 $\mu g/m^3$ (0.15 ppm).

sample
invitation

SAMPLE LETTER OF INVITATION

Date

Dear xxxxxxx:

On (date), the Metropolitan . . . . . Citizens Coalition for Clean Air will hold a workshop for area civic leaders on air pollution problems in this region. Its purpose is to help citizens become informed about regional air quality developments and to help civic leaders conduct effective, continuing citizen action on behalf of clean air in this area. The workshop's specific focus will be the adoption by area governments of air quality standards under the provisions of the federal Air Quality Act of 1967.

To acquaint you with this project, we have enclosed:

— a fact sheet with workshop information
— a program for the day
— a stamped, addressed card for your convenience in indicating your plans.

We would be very pleased to have you attend. As you will see from the enclosures, we are seeking a full representation of all community interests in clean air while attempting to keep the size of the group small enough to permit effective interchange within it.

Would you please indicate on the enclosed card whether or not you plan to attend the workshop? We would appreciate hearing from you by . . . . If other commitments prevent you from participating, please feel free to delegate someone from your organization to represent you.

There is no registration fee or other charge in connection with attendance at the workshop.

We hope very much that you will join us in this important project.

Sincerely,

Workshop Chairman

SAMPLE INFORMATION FOR INVITATION

AIR QUALITY IN THE . . . . . METROPOLITAN REGION

A WORKSHOP FOR CITIZENS

Fact Sheet

When and Where:	Wednesday, May 16, 197__ 9:00 a.m. to 4:30 p.m. Main Auditorium Central High School 678 Main Street City (Parking is available on the school lot.)
Sponsor:	The Metropolitan _____ Citizens Coalition for Clean Air, in cooperation with _____.
Chairman:	Mr. _____, President of _____.
Objective of Workshop:	To help create informed citizen participation in the implementation of the Air Quality Act of 1967 with special emphasis on public hearings that will be held by state and local governments in the _____ region to determine air quality standards
Audience:	100 selected area leaders in conservation, health, consumer affairs, community improvement, professional associations, the business community and public officials
For information:	Metropolitan _____ Citizens Coalition for Clean Air 123 Main Street City, State, Zip Code Phone (area code) _____

community interest groups

Conservation organizations, such as the Audubon Society, Izaak Walton League, Sierra Club, the National Wildlife Federation, and other affiliates of national and state groups as well as local conservation and beautification organizations.

Health organizations, such as tuberculosis associations and other voluntary organizations, medical societies, physicians and health researchers, public health groups.

Civic groups; service clubs, such as Kiwanis; civil rights organizations; neighborhood associations.

Women's groups, such as the League of Women Voters, American Association of University Women, Business and Professional Women's Associations, Federated Women's Clubs, Garden Clubs.

Youth groups, not only those with conservation programs such as Boy Scouts, Girl Scouts and Campfire Girls, but also urban youth groups such as the Boys Clubs.

Consumer organizations, including labor unions of many kinds.

Professional groups and associations of architects, planners, engineers, scientists, social scientists, economists, lawyers and others.

Educational institutions at all levels, and organizations of educators; science teachers, health and physical education instructors.

Elected public officials, especially city councilmen, county commissioners, and state legislators who have influence in local and state control programs.

Control agency officials.

Religious organizations.

Business and industrial organizations, such as the Chamber of Commerce.

The press.

And others. Historic preservation societies. Airline pilots. Art museum directors. Nurserymen. Citizen organizations promoting mass transit. And so on.

sample questionnaire

Mr. Mrs. Miss Dr. *please circle*

name (*please print*)

spouse's name (*if married*)

mailing address (*if in college, give school address*)

city county

state zip

telephone (home) work or school

occupation

YES, I WANT TO JOIN THE FIGHT FOR CLEAN AIR

Here's what I can do:

( ) wear a button
( ) telephone
( ) pass out literature to neighbors & friends
( ) do typing & other volunteer clerical work
( ) write letters to editors
( ) write letters to public officials
( ) join a study group
( ) serve on a publicity committee
( ) prepare testimony for a public hearing
( ) attend a public hearing
( ) testify at a public hearing
( ) review proposed implementation plans
( ) other (please specify)

THE NATURE OF MY INTEREST IS:

( ) health effects
( ) economic effects
( ) urban planning & redevelopment
( ) conservation & natural beauty
( ) relation to transportation
( ) long-term ecological effects

ORGANIZATIONS I BELONG TO:

_____

_____

_____

_____

OTHER ORGANIZATIONS OR INDIVIDUALS THAT SHOULD BE INVOLVED:

_____

_____

_____

_____

COMMENTS:

_____

_____

_____

_____

'71

sample testimony

ON PROPOSED AIR QUALITY STANDARDS*

This is the written statement of my testimony at the (date) public hearing on the proposed air quality standards for the (name of region). I submit this for inclusion in the hearing record.

My name is (*Mrs. John Smith*). I have been a (*area*) resident for approximately 45 years. It is obvious to anyone who has lived in the metropolitan area over a period of years that the quality of the air has steadily deteriorated. Years ago, when my children were small, I was very busy, and when I could, I would sometimes slip outdoors to take a few deep breaths of "fresh air." But when I breathe deeply now, I am very conscious of the pollution in the air. Perhaps I am more aware of the quality of the air we breathe than the average person, since I had tuberculosis 22 years ago, and I was cured only by a lobectomy.

In the interest of all area residents, I want to see the (*name of region*) have clean air and strong air quality standards. I would especially like to have a non-degradation clause included in the proposed air quality standards. I believe the long-range timetable should be reduced from seven to five years. I should also like to have a public hearing held on the implementation plans.

I endorse the proposals made by the Metropolitan Citizens' Coalition for Clean Air.

In closing, I would like to say that I regret that the (*name of agency*) gave such short notice of these proposals and of this hearing, since this makes it difficult for private citizens to arrange to attend and make our views known. Thank you.

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* This testimony was given by a citizen at a hearing. Specific names have been deleted.

citizen coalitions

SOME CITIZEN GROUPS CONCERNED WITH AIR POLLUTION

ATLANTA

Mr. John L. Glenn, Chairman
Clean Air Coalition
1021 Springdale Road, N.E.
Atlanta, Georgia 30306

BIRMINGHAM

Mr. K. W. Grimley
Alabama Air Conservation Commission
P.O. Box 3226
South Highland Station
Birmingham, Alabama 35205

BOSTON

Mr. Paul Brountas, Chairman
Metropolitan Boston Coalition for Cleaner Air
28 State Street
Boston, Massachusetts 02109

Miss Donna Bodley
Air Pollution Consultant
Boston Tuberculosis & Respiratory Disease Association
131 Clarendon Street
Boston, Massachusetts 02116

BUFFALO

Mr. William Troy
Niagara Frontier Citizens for Clean Air
155 Franklin Street
Buffalo, New York 14202

CHATTANOOGA

Mr. Clifford Betts, Jr., President
Citizens League for Environmental Action Now
514 Lookout Street
Chattanooga, Tennessee 37403

CHICAGO

Mr. John Kirkwood, Secretary
Clean Air Coordinating Committee
1440 West Washington Blvd.
Chicago, Illinois 60607

CINCINNATI

Mrs. Willard C. Pistler
Tri-State Air Committee
400 Covington Trust Building
Covington, Kentucky 41011

CLEVELAND

Mrs. Helen McCue
Citizens for Clean Air & Water
25065 Maple Ridge Road
North Olmsted, Ohio 44070

DALLAS

Mrs. Walter Lee Gill
10005 Linkwood Drive
Dallas, Texas 75238